

# GREAT SENECA CREEK ES GREEN BOOK



*[www.Schools2Green.org](http://www.Schools2Green.org)*

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# Great Seneca Creek Elementary School – Green Book

## 1. Introduction

- Welcome
- MCPS Green Building Program
- Narrative Green Educational Program
- Design Team Directory
- Drawings

## 2. LEED Information

- LEED Scorecard
- LEED Rating System and Project
- Great Seneca Creek- Little Bennett Comparison Chart

## 3. Resources

- Brochure
- Floor Plan with Legend
- Fortune Teller Game ( 1<sup>st</sup> & 2<sup>nd</sup> grade)
- Be a Green Detective Maze (1<sup>st</sup> & 2<sup>nd</sup> grade)
- Fortune teller Game (3<sup>rd</sup>-6<sup>th</sup> grade)
- Scavenger Hunt (3<sup>rd</sup>-6<sup>th</sup> grade)

## 4. Signage

- Signage Indoors
- Signage Outdoors
- Kiosk PowerPoint Green Building Features @ Great Seneca Creek and LEED

## 5. User Education on Energy and Water Conservation

- SERT Handbook
- Car Pooling Policy

## 6. High Performance Green Cleaning

## 7. Future Green Projects

Sponsors:

Special Thanks to NORESO for the donation of the Binder stand in the front lobby

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# Great Seneca Creek Elementary School – Green Book

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Department of Facilities Management  
Division of Construction  
2096 Gaither Road, Suite 203, Rockville, MD 20850  
Phone 240.314.1095 – Fax 240.314.1036  
[www.Schools2Green.org](http://www.Schools2Green.org)



February 1, 2007

Dear Friends and Employees of Great Seneca Creek Elementary School,

Welcome to the **Great Seneca Creek Green Book**. This book and CD is provided to you by the MCPS Green Building Program as a resource to learn about the environmental and green building features of this school building.

Great Seneca Creek Elementary School has been built as one of two green pilot schools for Montgomery County Public Schools.

In this book you will find information about LEED, which stands for Leadership in Energy and Environmental Design. It is a rating system that measures the “greenness” of a building by awarding points in six categories: Site, Water, Energy, Materials, Indoor Environment and Innovation.

The book also contains resources like a brochure, a map for a tour with interactive games for children, as well as a copy of all the green signage used at the school to explain how the building works, what the green building features are, and where the buildings energy and water come from. We also want you to understand where the building produces waste and what happens to that, so we included information about recycling and natural resources.

You will also find a copy of the SERT (School Eco Response Team) Handbook with tips and guidance on conserving energy and water, as well as a sample Carpooling Policy for the school.

And last but not least you will find the MCPS High Performance Healthy Cleaning Plan, a pilot that includes green products and equipment.

All signage is meant to be customized by the students and staff, so we consider this book and the files on the CD a good start, but hope that the staff and students, together with input from the community, will make this green school blossom.

Because Good Planets are hard to find....

Enjoy!

Anja S. Caldwell  
MCPS Green Building Program Manager

[www.Schools2Green.org](http://www.Schools2Green.org)

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Green Building Program

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### **First Public LEED School in Maryland - Great Seneca Creek ES in Germantown**

The new elementary school in Germantown is registered for a certification as the first public LEED School in Montgomery County and the State of Maryland. The school was designed to sustainable design standards as part of the 2005 MCPS High Performance Green Design Plan - a pilot project for the school district.

LEED stands for Leadership in Energy and Environmental Design and is a rating system from the US Green Building Council. The system provides a checklist for the design process in the categories of Sustainable Sites, Water Efficiency, Energy and Atmosphere, Material and Resources, Indoor Environmental Quality and Design Innovation.

The more points the project is able to achieve in the six categories, the higher the ranking and third party certificate, from a basic LEED certification to Silver, Gold and Platinum.

A design charrette conducted in 2003 with members from the MCPS Department of Facilities Management and national green building experts determined the energy and environmental design goals for this pilot project.

Some of the environmental design features of the project are e.g. 43% savings in water with low-flow appliances, including flushless urinals and dual flush options for toilets. The school has a geothermal system with all the piping buried under the athletic field. The constant ground temperature will provide heat in the winter and cooling in the summer. This "free" energy is expected to save about \$0.45 per sq. ft. a year in energy use and maintenance. The building also has a white Energy Star roof, which helps avoid the Heat Island Effect- the heating of the atmosphere through dark surface. This will reduce the air conditioning load of the building, as most schools at MCPS are now used throughout the year.

A comprehensive green information kiosk will be located in the lobby. This presentation will be tied into a keyed building tour that will explain the green and LEED related features of the building to students, staff and community members. Signs will be posted in all the classrooms, by the windows and at mechanical rooms as an educational and informative tool.

The signs can be customized by the students, as this building will function as a 3D textbook with active student involvement in MCPS' SERT program. User Education and behavior is an important factor in energy use and can make an average difference of 15% on the utility bills of a school.

More information on this pilot and the Green Building Program at MCPS is available on the MCPS Green Schools Focus website [www.Schools2Green.org](http://www.Schools2Green.org) - Green Building.

Contact: Anja S. Caldwell, LEED accredited Architect on staff and Green Building Program Manager at MCPS, Phone 240.314.1095, E-mail [Anja\\_S\\_Caldwell@mcpsmd.org](mailto:Anja_S_Caldwell@mcpsmd.org)

**Mission**

The Green Building Program of Montgomery County Public Schools provides leadership in energy and environmental design for all schools and staff.

The program advocates environmental stewardship and resource conservation through intelligent design, technology pilots, high performance green design training, and design standard reviews for effectiveness and adoption of latest technologies and strategies.

**Contact:**

Anja S. Caldwell, LEED accredited Architect

Green Building Program Manager of the Green Schools Focus within the DFM

**Training and Outreach:**

- Green User Education Programs
- Educational Outreach with school competitions and at county and school fairs (e.g. Going Green At Home)
- Classroom visits
- High Performance Design Training
- High Performance Design Reviews
- High Performance Advocacy and Mentorship to other school districts

**Resources:**

- [www.Schools2Green.org](http://www.Schools2Green.org) – MCPS Green Building Program
- MCPS High Performance Architectural Design Guidelines
- MCPS High Performance Green Design Plan
- Powerpoints on Green Building, LEED, Pilot Projects
- Annual Resource Conservation Plan
- SERT Handbook for Resource Conservation

**Affiliations:**

- Member of National US Green Building Council and local USGBC Chapter for the National Capital Region - Anja S. Caldwell is on the national core committee for the development of LEED for Schools for the US Green Building Council, together with members from CHPS (Collaborative for High Performance Schools) and other school districts in CA, PA, NC, NJ and OR. The new rating system will be released Spring 2007.
- Member of CEFPI
- Green Building Advisory for Montgomery County Council



## **Other Green Building Technology Pilots at MCPS – List of locations available on request**

### **Sustainable Sites**

- Vegetated Roof
- Pervious Paving
- Native and non-invasive Plantings
- Educational Gardens
- Bioretention
- Cisterns
- Raingardens
- Now-Mow Zones
- Energy Star White Roofs
- Schoolyard Habitat Projects
- Composting

### **Water Efficiency**

- Low-Flow Faucets and Showerheads
- Waterless Urinals
- Dual Flush Technology
- Irrigation Control

### **Energy Conservation**

- Building Envelope Improvements
- Low-e Fiberglass windows
- Cool Daylighting
- Re-lamping
- Interior and Exterior Lighting Controls
- Lighting Standardization
- Occupancy Sensors
- Geothermal Hydronic Heat Pumps
- High Efficiency Boilers
- Plug Load Control
- Energy Recovery
- On site energy generation – Solar and Wind
- Green Power Procurement
- Energy Star Appliances
- Energy Star Design
- User Education Programs

### **Materials**

- Consumer Recycling
- Construction Waste Recycling
- Use of Local Materials
- Recycled Content Materials
- Low emitting paints, sealants and adhesives
- Formaldehyde free insulation
- Formaldehyde Free Wood Composites
- Use of Forest Stewardship Council Certified Wood

### **Operations**

- Integrated Pest Management
- Green Cleaning Equipment
- Healthy, High Performance Cleaning Initiative
- Tools for Schools IAQ Management

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## Great Seneca Creek User Education Program

A green information kiosk is located in the lobby. The kiosk includes a binder on a stand for the community with information about LEED, the schools green building features and resources for the keyed tour, as well as copies of the 8 1/5 x 11" signage throughout the building. There is also a large monitor that has the green building information as a looped slide show. A copy of the slide show, all signage and lots of other information about the green building and LEED are also on the website at <http://www.mcps.k12.md.us/departments/facilities/greenschoolsfocus/gsc.shtm> to students, staff and the community at large.

A keyed building tour and scavenger hunt explains the green and LEED related features of the building to students, staff and community members. There are also number and word games as well as an origami fortune teller explaining the building. These resources are available to the teachers and parents. 8 1/2 x 11 signs are posted in all the classrooms, by the windows, at water fountains and at mechanical rooms as an educational tool for students, teachers and parents. Signs outdoors will explain the no-mow areas, wetland, native vegetation and geothermal field under the ball field.

The signs can be customized by the student's environmental club, as this building will function like a 3D textbook with active student involvement in MCPS' environmental programs. User education and behavior modification can make a difference of more than 15% for the utility bills of a school. MCPS, through its SERT (School Eco Response Team), makes an ongoing effort to train users in energy and resource conservation. Information about the program is on the website at [www.greenschoolsfocus.org](http://www.greenschoolsfocus.org) – SERT. Participation in the program is mandatory for all MCPS schools.

MCPS has three SERT Facilitators on staff who visit the school periodically from the central office and make sure the conservation programs are still in place and the policies are adhered to. The SERT Handbook is on the website and in green binder in the lobby, as well as in the building service managers office.

Once students and teachers are more familiar training of fourth graders is in place to conduct tours without the help of the Green Building Program Manager.

So far several tours have been conducted for community members, elected officials, other school districts, teachers and building services staff etc. and the principal and staff are prepared to conduct many more on any day other than Fridays, which they picked as a "tour free" day.

MCPS has a central Green Building Program which is in close contact with the green building and school construction community. We frequently inform and invite about green building events and conduct tours of our various green building pilots.

Rockville, September 13<sup>th</sup>, 2006



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Telephone 240. 314.1095 Fax 240. 314.1037  
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## Great Seneca Creek Elementary School - Design Team Directory

### MCPS Project Manager:

Mike Shpur AIA and Joe Derosa AIA

### Architect:

Bridget Ahmad and Amy Upton,  
Grimm and Parker

### Mechanical Engineer:

Mike McKenna, James Posey Associates

### LEED Consultant:

Sandra Leibowitz and Kara Strong,  
Sustainable Design Consulting

### MCPS LEED AP on Staff:

Anja S. Caldwell

### Civil Engineer:

Shawn Benjaminson, Adtek Engineers

### Structural Engineer:

Ron Wolfram, Wolfram & Associates

### Commissioning:

Paul Tseng, Advanced Building Performance

### Landscape Architect:

Miles Barnard, South Fork Studios

### General Contractor:

Chris Flaherty, HESS Construction

# GREAT SENECA CREEK ELEMENTARY SCHOOL

GERMANTOWN, MARYLAND



GRIMM+  
PARKER  
ARCHITECTS

***GREAT SENECA CREEK ELEMENTARY SCHOOL***  
***Montgomery County Public Schools***



# LEED POINT SYSTEM

The goal for Great Seneca Creek Elementary School is to achieve the LEED **Certified** rating.

The LEED (Leadership in Energy and Environmental Design) Green Building Rating System™ is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. Projects earn points towards certification by meeting or exceeding each credit's requirements for each section.

Great Seneca Creek ES will be one of a handful of LEED certified schools in the county, and may be the first school ever to be LEED certified in the state of Maryland.

## LEED™ Credit Scorecard

LEED™ Green Building Rating System, version 2.1, final version w/ revisions

## Northwest #7 Elementary School

Grimm + Parker Architects

March 31, 2006



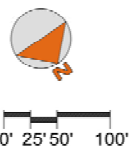
33			9			27			Total Project Score			Possible Points			69		
Certified 26 to 32 points			Silver 33 to 38 points			Gold 39 to 51 points			Platinum 52 or more points								
7			7			Sustainable Sites			Possible Points			14					
Y	?	N	Y	?	N	Prereq 1	Erosion & Sedimentation Control										
1			1			Credit 1	Site Selection		1								
						Credit 2	Development Density		1								
						Credit 3	Brownfield Redevelopment		1								
						Credit 4.1	Alternative Transportation, Public Transportation Access		1								
						Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms		1								
						Credit 4.3	Alternative Transportation, Alternative Fuel Refueling Stations		1								
						Credit 4.4	Alternative Transportation, Parking Capacity and Carpooling		1								
						Credit 5.1	Reduced Site Disturbance, Protect or Restore Open Space		1								
						Credit 5.2	Reduced Site Disturbance, Development Footprint		1								
						Credit 6.1	Stormwater Management, Rate and Quantity		1								
						Credit 6.2	Stormwater Management, Treatment		1								
						Credit 7.1	Landscape & Exterior Design to Reduce Heat Islands, Non-Roof		1								
						Credit 7.2	Landscape & Exterior Design to Reduce Heat Islands, Roof		1								
						Credit 8	Light Pollution Reduction		1								
4			1			Water Efficiency			Possible Points			5					
Y	?	N	Y	?	N	Credit 1.1	Water Efficient Landscaping, Reduce by 50%		1								
						Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation		1								
						Credit 2	Innovative Wastewater Technologies		1								
						Credit 3.1	Water Use Reduction, 20% Reduction		1								
						Credit 3.2	Water Use Reduction, 30% Reduction		1								
8			1			Energy & Atmosphere			Possible Points			17					
Y	?	N	Y	?	N	Prereq 1	Fundamental Building Systems Commissioning										
Y			Y			Prereq 2	Minimum Energy Performance										
Y			Y			Prereq 3	CFC Reduction in HVAC&R Equipment										
						Credit 1.1	Optimize Energy Performance, 20% New / 10% Existing		2								
						Credit 1.2	Optimize Energy Performance, 30% New / 20% Existing		2								
						Credit 1.3	Optimize Energy Performance, 40% New / 30% Existing		2								
						Credit 1.4	Optimize Energy Performance, 50% New / 40% Existing		2								
						Credit 1.5	Optimize Energy Performance, 60% New / 50% Existing		2								
						Credit 2.1	Renewable Energy, 5%		1								
						Credit 2.2	Renewable Energy, 10%		1								
						Credit 2.3	Renewable Energy, 20%		1								
						Credit 3	Additional Commissioning		1								
						Credit 4	Elimination of HCFC's and Halons		1								
						Credit 5	Measurement & Verification		1								
						Credit 6	Green Power		1								
5			2			Materials & Resources			Possible Points			13					
Y	?	N	Y	?	N	Prereq 1	Storage & Collection of Recyclables										
						Credit 1.1	Building Reuse, Maintain 75% of Existing Shell		1								
						Credit 1.2	Building Reuse, Maintain 100% of Shell		1								
						Credit 1.3	Building Reuse, Maintain 100% Shell & 50% Non-Shell		1								
						Credit 2.1	Construction Waste Management, Divert 50%		1								
						Credit 2.2	Construction Waste Management, Divert 75%		1								
						Credit 3.1	Resource Reuse, Specify 5%		1								
						Credit 3.2	Resource Reuse, Specify 10%		1								
						Credit 4.1	Recycled Content, Specify 5% (post-consumer + 1/2 post-industri		1								
						Credit 4.2	Recycled Content, Specify 10% (post-consumer + 1/2 post-industri		1								
						Credit 5.1	Local/Regional Materials, 20% Manufactured Locally		1								
						Credit 5.2	Local/Regional Materials, of 20% Above, 50% Harvested Locally		1								
						Credit 6	Rapidly Renewable Materials		1								
						Credit 7	Certified Wood		1								
4			6			Indoor Environmental Quality			Possible Points			15					
Y	?	N	Y	?	N	Prereq 1	Minimum IAQ Performance										
Y			Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control										
						Credit 1	Carbon Dioxide (CO2) Monitoring		1								
						Credit 2	Ventilation Effectiveness		1								
						Credit 3.1	Construction IAQ Management Plan, During Construction		1								
						Credit 3.2	Construction IAQ Management Plan, Before Occupancy		1								
						Credit 4.1	Low-Emitting Materials, Adhesives & Sealants		1								
						Credit 4.2	Low-Emitting Materials, Paints		1								
						Credit 4.3	Low-Emitting Materials, Carpet		1								
						Credit 4.4	Low-Emitting Materials, Composite Wood		1								
						Credit 5	Indoor Chemical & Pollutant Source Control		1								
						Credit 6.1	Controllability of Systems, Perimeter		1								
						Credit 6.2	Controllability of Systems, Non-Perimeter		1								
						Credit 7.1	Thermal Comfort, Comply with ASHRAE 55-1992		1								
						Credit 7.2	Thermal Comfort, Permanent Monitoring System		1								
						Credit 8.1	Daylight & Views, Daylight 75% of Spaces		1								
						Credit 8.2	Daylight & Views, Views for 90% of Spaces		1								
5						Innovation & Design Process			Possible Points			5					
Y	?	N	Y	?	N	Credit 1.1	Innovation in Design: 40% Locally Manufactured Materials		1								
						Credit 1.2	Innovation in Design: Green User Education Program		1								
						Credit 1.3	Innovation in Design: Green Housekeeping Plan		1								
						Credit 1.4	Innovation in Design: 40% Water Efficiency		1								
						Credit 2	LEED™ Accredited Professional		1								

Sustainable Design Consulting

**GRIMM +  
PARKER**  
ARCHITECTS

**GREAT SENECA CREEK ELEMENTARY SCHOOL**  
**Montgomery County Public Schools**

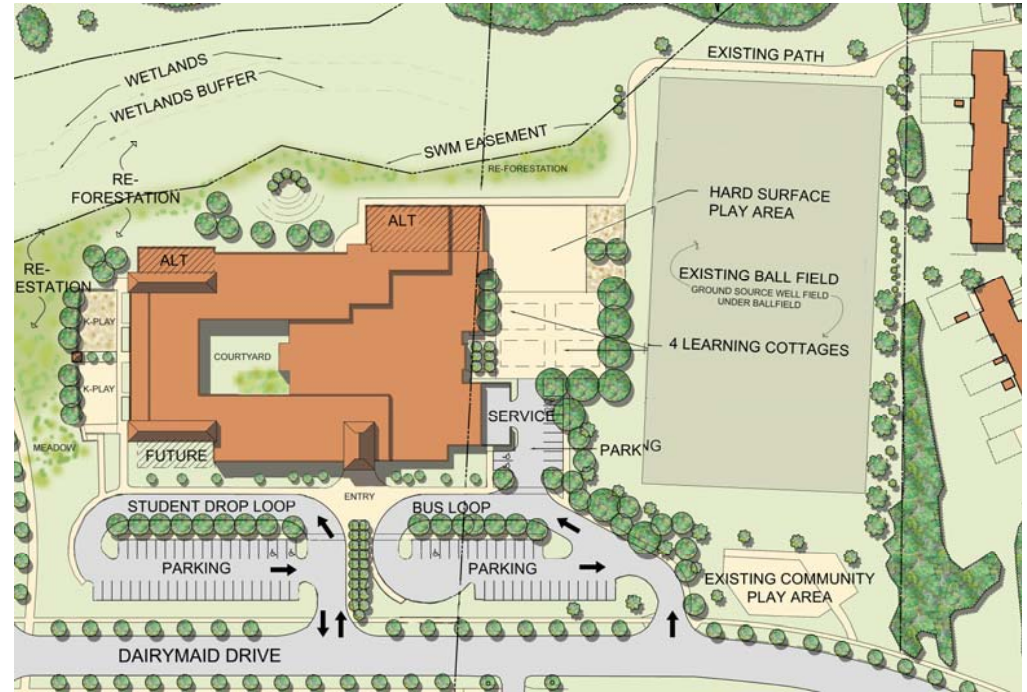
# GREAT SENECA CREEK ES SITE PLAN





# SUSTAINABLE SITES

- **ALTERNATES:** The **GYM ADDITION** and **4-CLASSROOM ADDITION** will be built at both sites.
- **BUILDING ORIENTATION:** Classrooms oriented to the north and to the south, optimum for taking advantage of sun for natural daylighting (thus reducing the need for artificial lighting).
- **COMPACT FOOTPRINT/OVERLAPPING FIELDS:** By making the school a compact, two-story structure with double loaded corridors, we were able to avoid long wings and keep the building footprint closer to a tight square. The ball fields overlap one another to minimize environmental impact.
- **WETLANDS:** School site does not encroach on neighboring stream valley or wetlands on the property.
- **LIGHT POLLUTION REDUCTION**
- **SHADE and HIGH-ALBEDO:** Provide shade on play and parking paving from site trees and use high-albedo materials (such as concrete paving).
- **ENERGY STAR ROOF:** Energy Star-rated coating over built-up roofing to reduce heat island effect on the building's flat roofs.

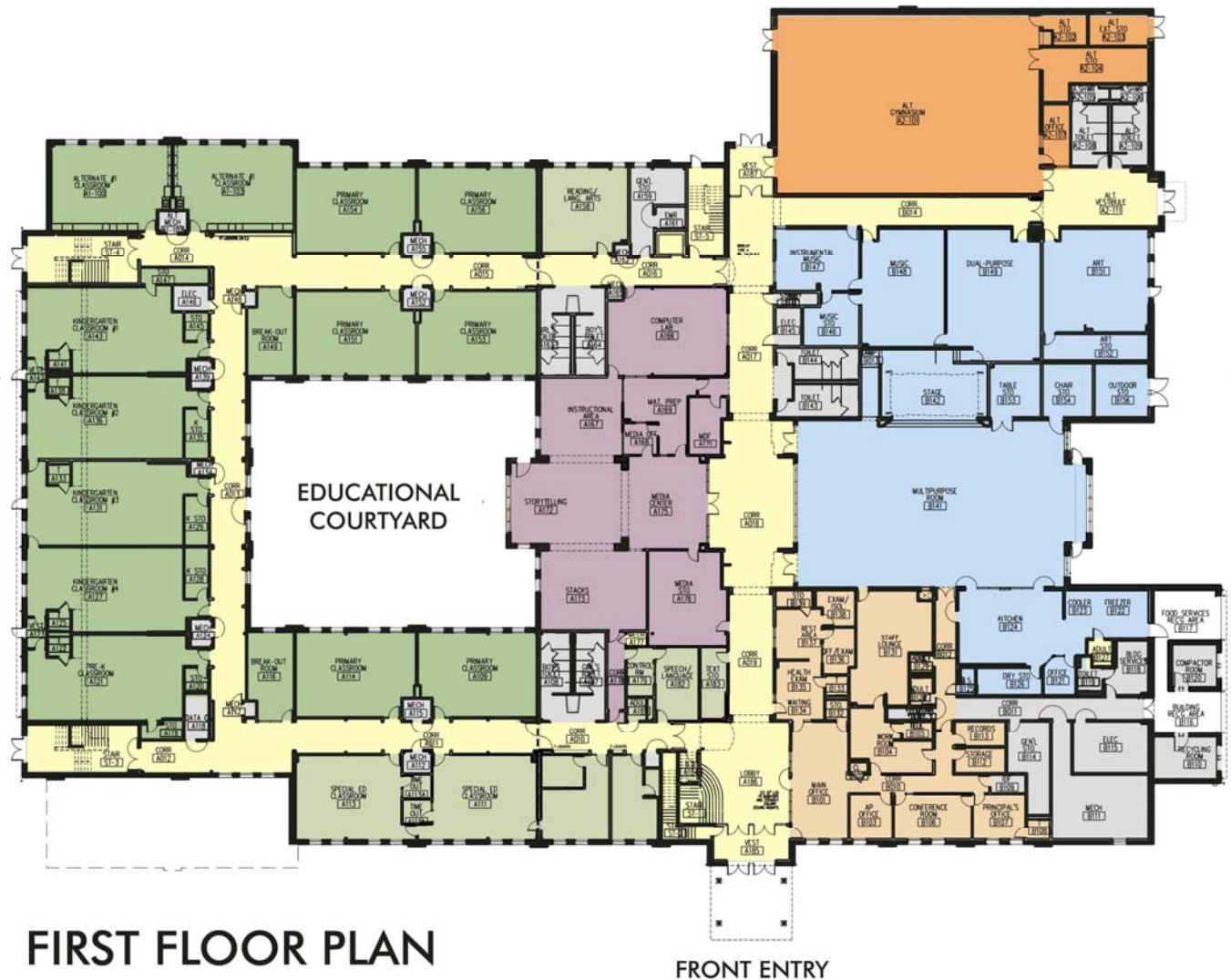


- **GEOTHERMAL:** School will utilize adjacent ballfields for ground-source well fields (efficient mechanical system).
- **REFORESTATION/MEADOWS:** on southern slope of hill
- **NATIVE PLANTINGS:** Require no site watering.



## OTHER “GREEN”/”SUSTAINABLE” BENEFITS INCLUDE:

- BIKE STORAGE W/  
SHOWER/CHANGING ROOMS  
TO ENCOURAGE BIKING TO  
WORK FOR STAFF
- WATERLESS URINALS IN  
CLASSROOM WING’S GROUP  
TOILETS
- DUAL-FLUSH TOILETS IN  
KINDERGARTEN CLASSROOMS
- LOW-FLOW AERATORS AND  
SHOWER HEADS
- SENSORED FAUCETS IN  
MULTI-FOUNT LAVATORIES
- GREEN POWER
- ENERGY EFFICIENT  
FIBERGLASS WINDOWS W/  
LOW-E, INSULATED GLASS
- DEDICATED AREAS FOR  
STORAGE AND COLLECTION  
OF RECYCLABLES  
(RECYCLING ROOM AT  
LOADING DOCK FOR SORTING)



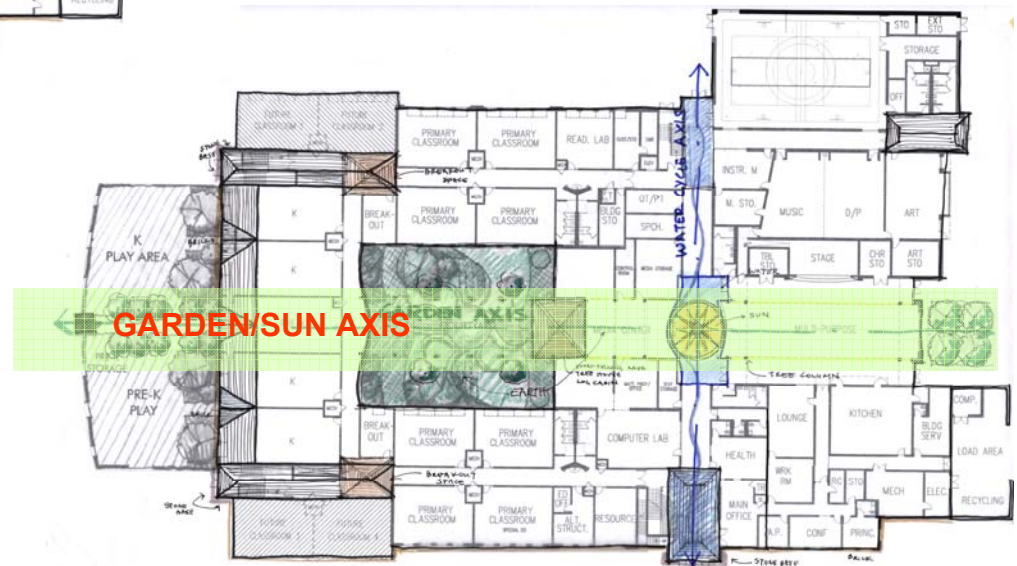
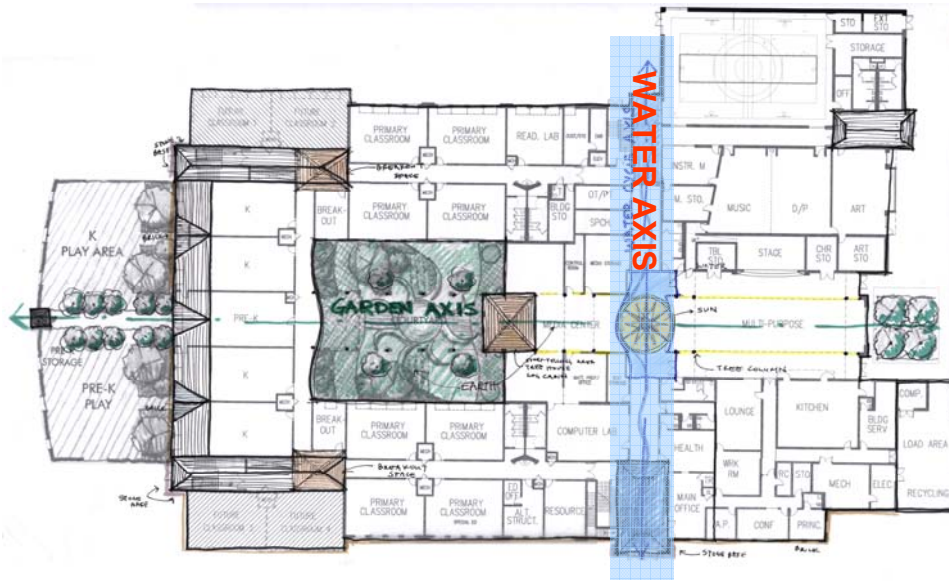
## OTHER “GREEN”/”SUSTAINABLE” BENEFITS INCLUDE:

- BUILDING COMMISSIONING DURING DESIGN, CONSTRUCTION, AND PRIOR TO OCCUPANCY
- ELECTRIC HAND DRYERS IN BOYS' AND GIRLS' GROUP TOILET ROOMS IN CLASSROOM WINGS
- CONSTRUCTION WASTE MANAGEMENT
- LOW-EMITTING MATERIALS (ADHESIVES AND SEALANTS, PAINTS, CARPETS, ETC.)
- WHEATBOARD CASEWORK IN CLASSROOMS AND INSTRUCTIONAL MEDIA CENTER
- HIGH PERCENTAGE OF RECYCLED MATERIALS (INCLUDING RECYCLED TOILET PARTITIONS)
- MAXIMUM NATURAL DAYLIGHT IN CLASSROOMS (LARGE WINDOWS, SLOPED CEILINGS, LIGHT COLORS)



## SECOND FLOOR PLAN

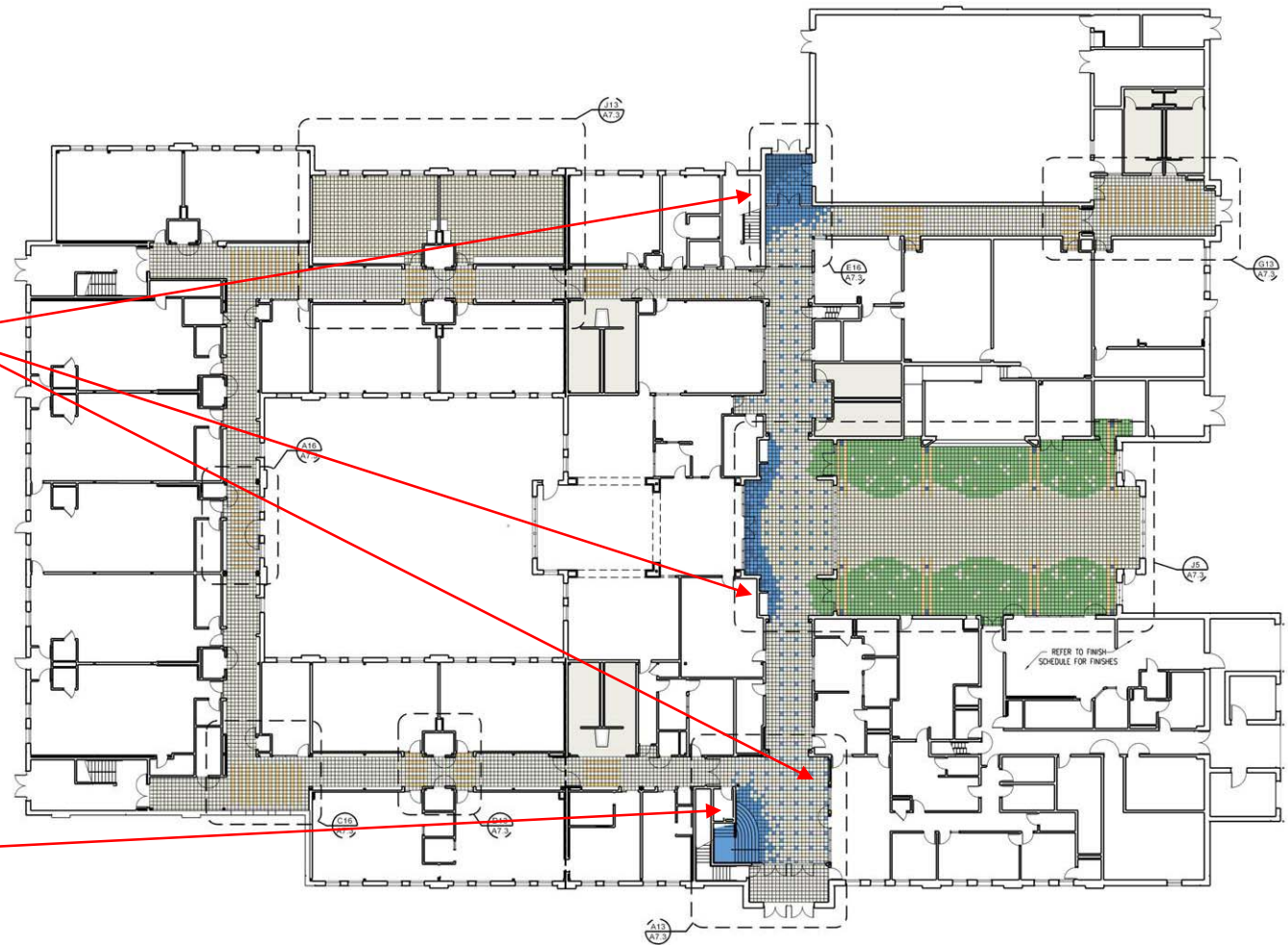
# GREAT SENECA CREEK ES CONCEPT PLAN





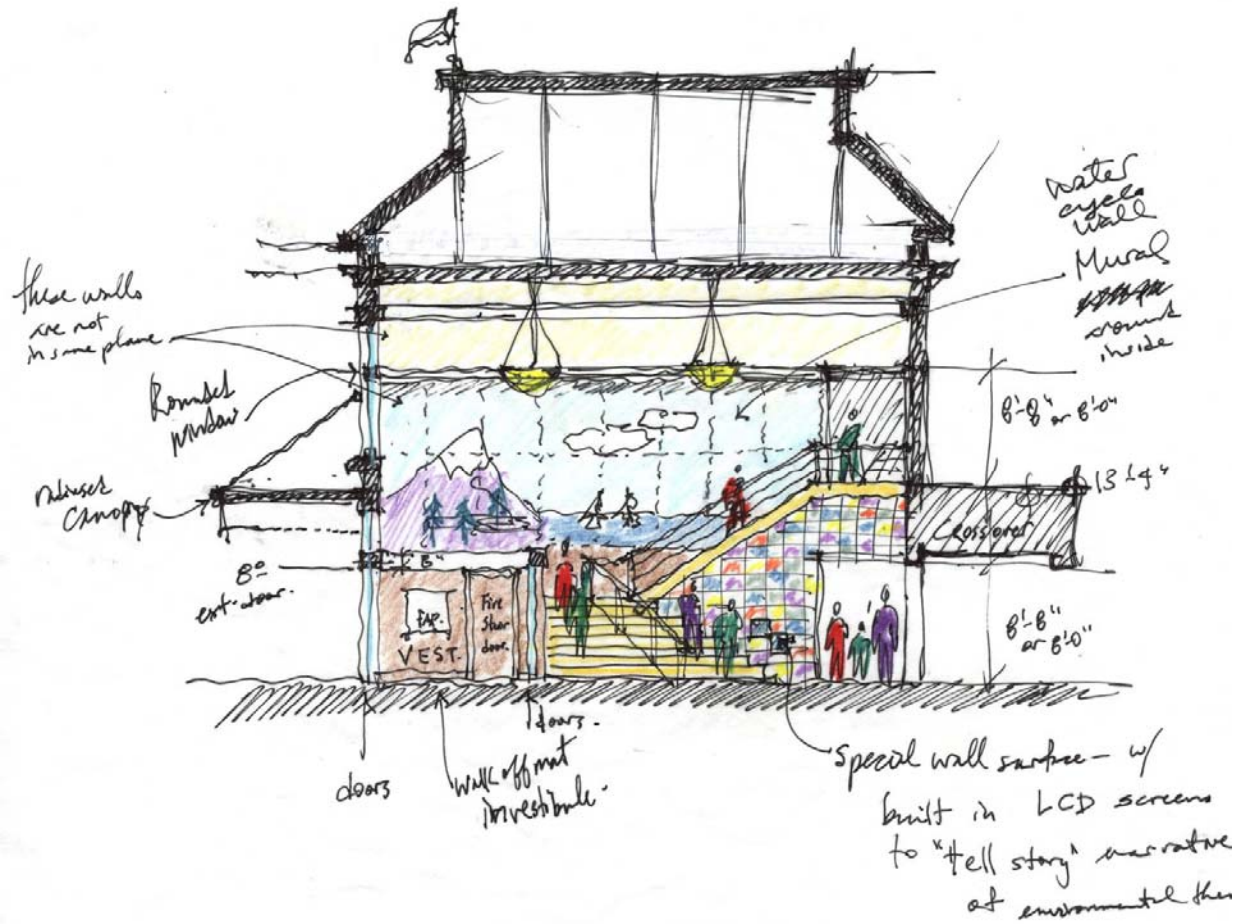
# GREEN ED PROGRAM

- Design of building is tied into the Green Schools Program
- Display boards/signs and monitors throughout the building to exhibit how the building works and how the environment affects it
- Creative floor patterns and mural at entrance stair inspire and educate students about the environment

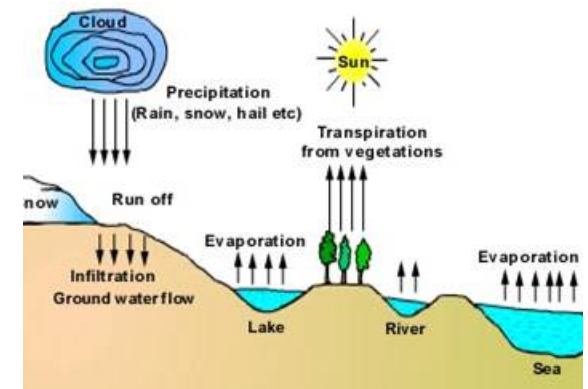


FIRST FLOOR PATTERN

# FRONT ENTRY VESTIBULE STUDIES



General Water Cycle Diagram





# WATER USE REDUCTION

- **WATERLESS URINALS**

The conventional urinal uses 1 gpf.

**Waterless urinals** use no water at all.

Savings in water usage

Annual maintenance savings

Eliminate odors and are less prone to bacterial growth due to lack of water

- **WATER CONSERVING FIXTURES**

**Dual/Single Flush** toilets in Kindergarten classrooms provide two different flush volumes and can be used as a teaching tool to teach children about water conservation.

**Multi-font lavatories** for students to wash their hands under teacher supervision and conserve water with sensed faucets.

**Low-flow** shower heads in changing rooms and low-flow faucets in classrooms.



# MATERIALS

- Long term view balances immediate cost
- Reduce VOC content
- Monitor raw material extraction
- Use of renewable products
- Use of recycled products
- Minimal transportation to site
- Monitor manufacturing energy costs

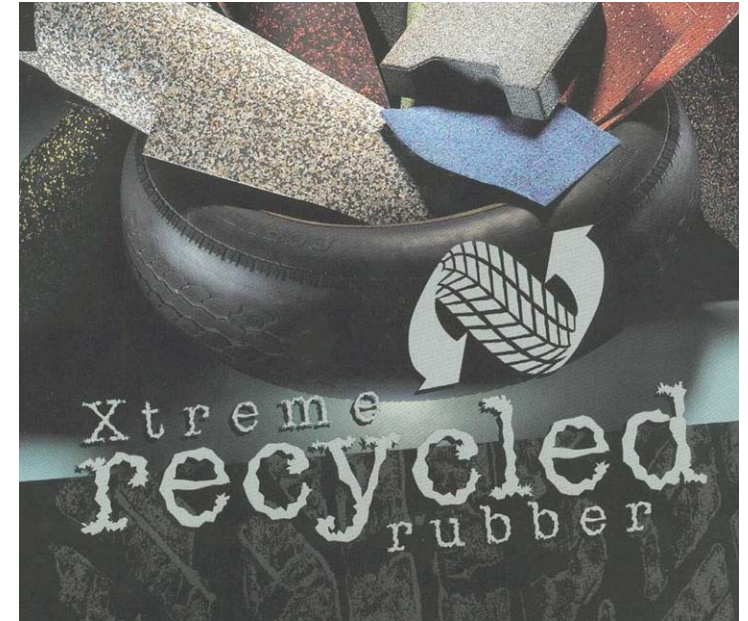
Resource-efficient products not only contribute to improving indoor air quality, energy efficiency and durability of school, but also help to reduce harm to the natural environment.





# RECYCLING

- Program for Recycling During Construction and Occupancy
- Provide dedicated recycling zones for staff and students
- Specify materials that promote Industry Recycling such as:
  - Metals
  - Flooring
  - Ceilings
  - Concrete
  - Coatings



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***GREAT SENECA CREEK ELEMENTARY SCHOOL***  
***Montgomery County Public Schools***



- RECYCLING CONTAINER
- RECYCLING COLLECTION POINT
- MAIN RECYCLING ROOM FOR BUILDING



**FIRST FLOOR PLAN**  
**PROPOSED RECYCLING CONCEPT PLAN**

FRONT ENTRY

**GRIMM+**  
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 ARCHITECTS

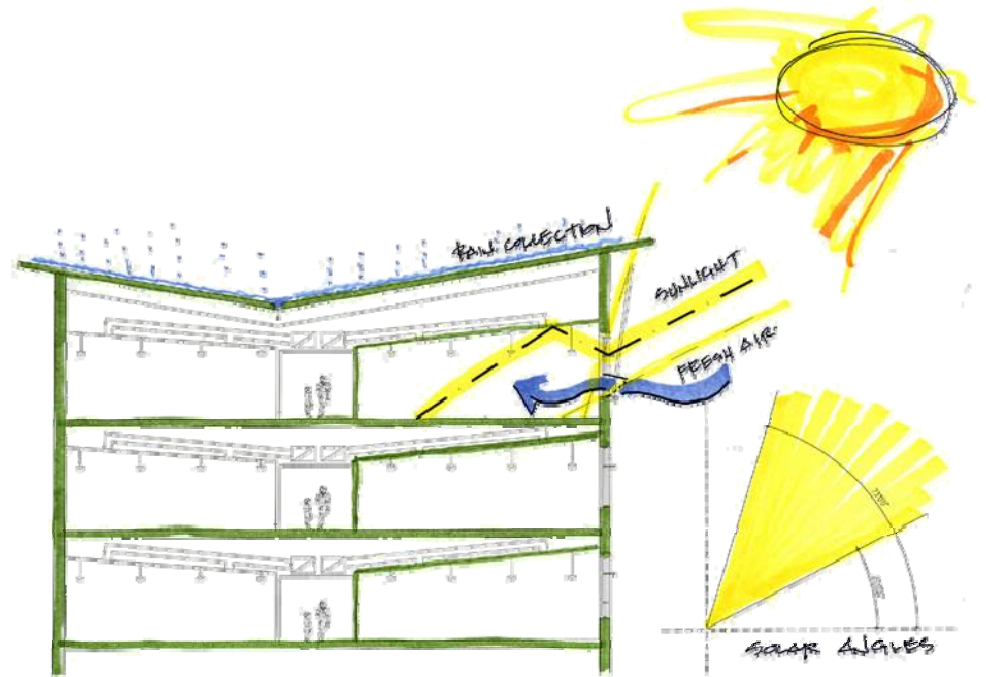
***GREAT SENECA CREEK ELEMENTARY SCHOOL***  
*Montgomery County Public Schools*



### KEY for MRp1

# INDOOR ENVIRONMENTAL QUALITY

- Construction IAQ Plan
  - minimize preoccupancy contamination
  - protection of HVAC equipment and filters
- Low Emitting Materials
  - meet or exceed VOC limits for adhesive, sealants, paint and carpet
  - no added formaldehyde resins
- Daylighting and Views
  - indoor and outdoor connectedness
  - horizontal blinds act as louvers to bounce light on ceilings and deep into rooms
  - avoid direct sunlight and glare as much as possible
- Individual Control
  - operable windows
  - 200 SF per lighting zone
  - occupant controlled thermostat





# FRONT ENTRY ELEVATION



## Windows:

Typical classrooms are oriented in the long direction along the window wall to maximize daylight.

Large fiberglass windows with double-paned, low-e insulating glazing in every classroom to maximize natural daylight transmittance into the room, but control radiant heat transfer.

## Materials:

Metal shingles

Locally-available brick



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# DAYLIGHTING

- Can drastically reduce lighting, heating, and cooling requirements and energy consumption
- Creates healthier learning environments that will result in increased attendance and improved grades
- Large windows and blinds provide uniform natural light in a room without distracting glare
- Light-colored interior finishes will help natural light to reflect deeper into room
- Interior colors can increase brain stimulation, muscle relaxation and reduce blood pressure



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# DAYLIGHT SIMULATION

## (PRIOR TO ELEVATION REVISIONS)

### BASE CASE – NO INTERIOR SHADES

### 12 P.M.

#### OVERCAST CONDITIONS

Issues:

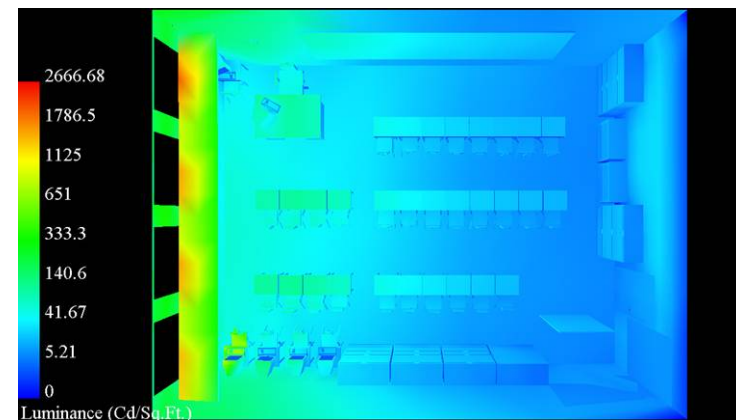
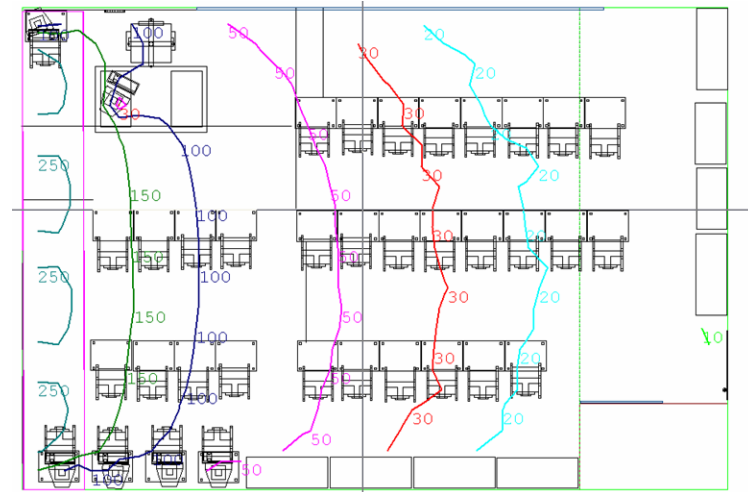
The calculations show that light levels are distributed fairly evenly throughout the room. The lowest light level readings are located in the west corner of the room as expected due to the skylight monitor placement.

Daylight factor calculations show that the average daylight factor is 4.09%.

#### SUNNY CONDITIONS

Issues:

**Very high light levels were calculated (4000+fc) within a 3 ft. distance from the main windows.** Light levels fall off dramatically from this point towards the interior of the room. While held closer to the perimeter as sun angles get steeper, the **high brightness sill creates an uncomfortable condition of excessive glare.**



# TYPICAL CLASSROOM SECTION STUDY

## SLOPED CEILINGS:

BOUNCE LIGHT DEEPER INTO CLASSROOM.

## HORIZONTAL LOUVER BLINDS:

CONTROL DAYLIGHT AND GLARE.  
BLINDS CAN ACT AS LOUVERS AND DIRECT  
DIFFUSED LIGHT DEEPER INTO ROOM.

## OPERABLE WINDOWS:

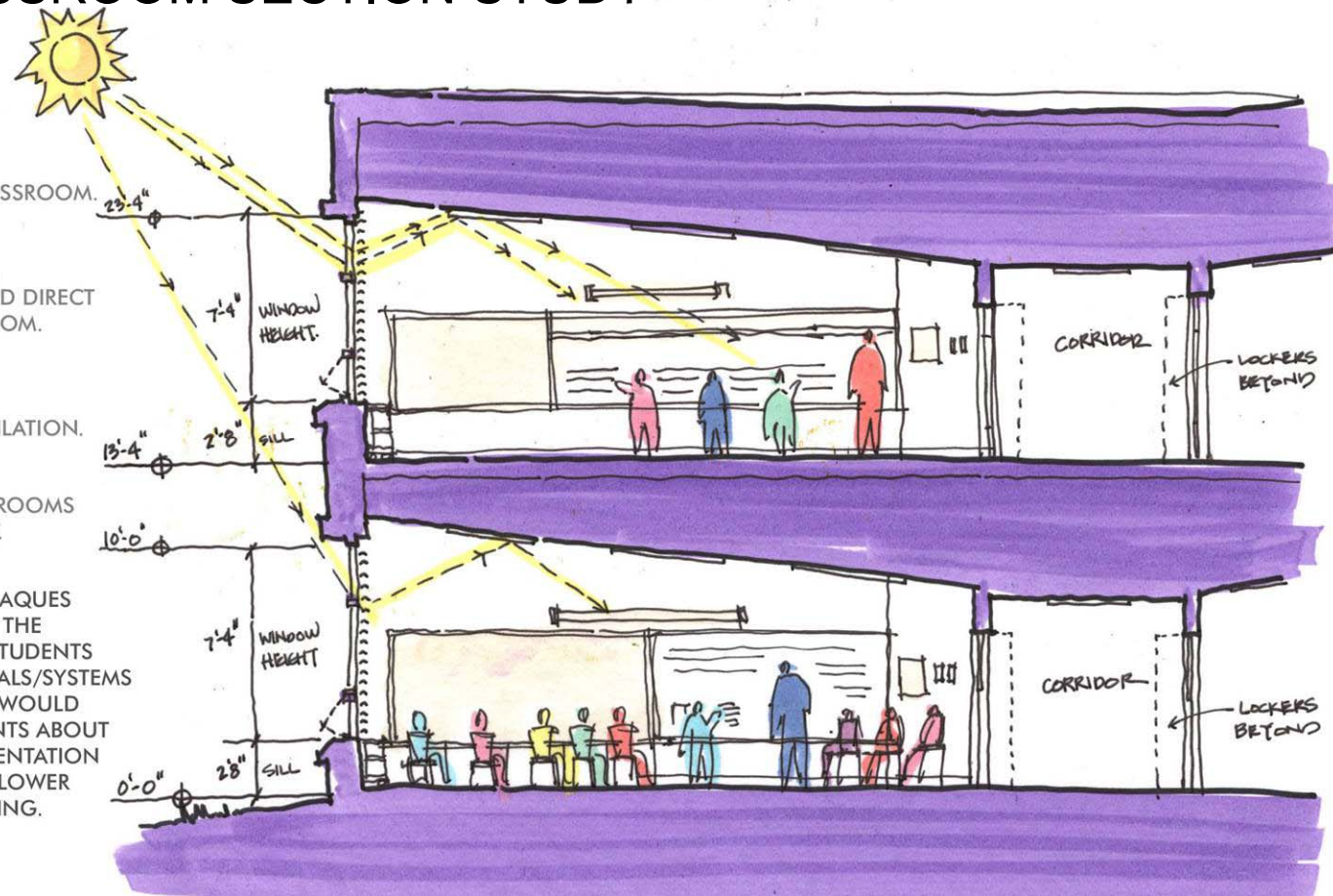
INDIVIDUAL CONTROL IN EACH  
CLASSROOM FOR NATURAL VENTILATION.

## MATERIALS:

LIGHT, BRIGHT COLORS IN CLASSROOMS  
TO MAXIMIZE NATURAL DAYLIGHT.

## EDUCATIONAL SIGNAGE:

DISPLAY PLAQUES  
WILL BE LOCATED THROUGHOUT THE  
BUILDING TO ALERT STAFF AND STUDENTS  
ABOUT THE SUSTAINABLE MATERIALS/SYSTEMS  
USED. IN CLASSROOMS, A SIGN WOULD  
EDUCATE TEACHERS AND STUDENTS ABOUT  
THEIR CLASSROOM'S SOLAR ORIENTATION  
AND TELL THEM WHEN TO RAISE/LOWER  
BLINDS FOR OPTIMUM DAYLIGHTING.



**TALL WINDOWS IN EVERY CLASSROOM TO MAXIMIZE NATURAL DAYLIGHT**

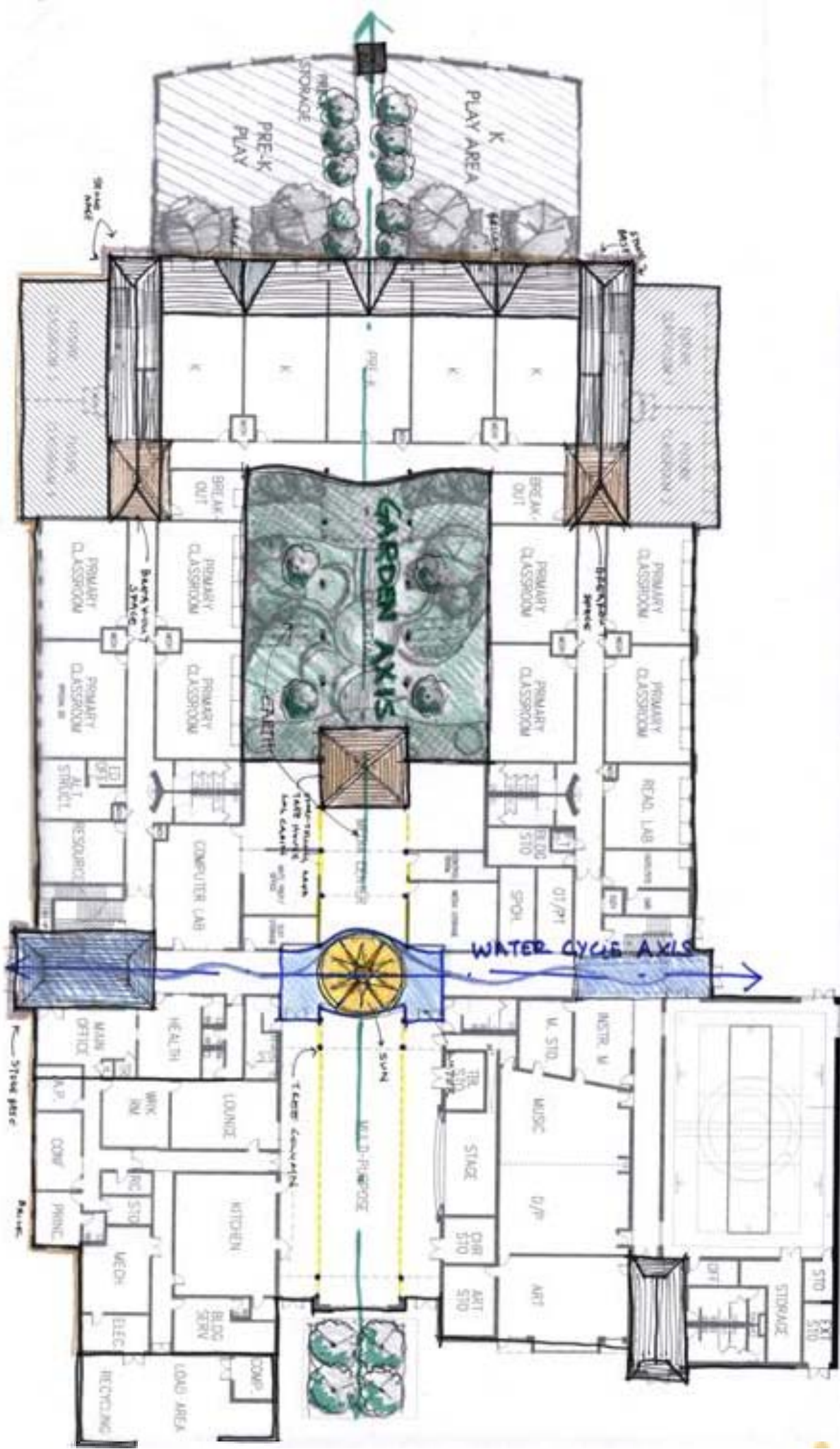
KEY PLAN



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# **Great Seneca Creek Elementary School – Green Book**

## **2. LEED Information**

- LEED Scorecard
- LEED Rating System and Project
- Great Seneca Creek- Little Bennett Comparison Chart

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# LEED™ Credit Scorecard

LEED™ Green Building Rating System, version 2.1, final version w/ revisions

## Great Seneca Creek ES

Montgomery County Public Schools



March 12, 2007

40	29	<b>Total Project Score</b>	Possible Points <b>69</b>
----	----	----------------------------	---------------------------

**Certified** 26 to 32 points **Silver** 33 to 38 points **Gold** 39 to 51 points **Platinum** 52 or more points

7	7	<b>Sustainable Sites</b>	Possible Points <b>14</b>
---	---	--------------------------	---------------------------

Y	?	N			
Y			Prereq 1	Erosion & Sedimentation Control	
1			Credit 1	Site Selection	1
		1	Credit 2	Development Density	1
		1	Credit 3	Brownfield Redevelopment	1
		1	Credit 4.1	Alternative Transportation, Public Transportation Access	1
1			Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1
		1	Credit 4.3	Alternative Transportation, Alternative Fuel Refueling Stations	1
1			Credit 4.4	Alternative Transportation, Parking Capacity and Carpooling	1
		1	Credit 5.1	Reduced Site Disturbance, Protect or Restore Open Space	1
1			Credit 5.2	Reduced Site Disturbance, Development Footprint	1
		1	Credit 6.1	Stormwater Management, Rate and Quantity	1
1			Credit 6.2	Stormwater Management, Treatment	1
		1	Credit 7.1	Landscape & Exterior Design to Reduce Heat Islands, Non-Roof	1
1			Credit 7.2	Landscape & Exterior Design to Reduce Heat Islands, Roof	1
1			Credit 8	Light Pollution Reduction	1

4	1	<b>Water Efficiency</b>	Possible Points <b>5</b>
---	---	-------------------------	--------------------------

Y	?	N			
1			Credit 1.1	Water Efficient Landscaping, Reduce by 50%	1
1			Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	1
		1	Credit 2	Innovative Wastewater Technologies	1
1			Credit 3.1	Water Use Reduction, 20% Reduction	1
1			Credit 3.2	Water Use Reduction, 30% Reduction	1

9	8	<b>Energy &amp; Atmosphere</b>	Possible Points <b>17</b>
---	---	--------------------------------	---------------------------

Y	?	N			
Y			Prereq 1	Fundamental Building Systems Commissioning	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	CFC Reduction in HVAC&R Equipment	
2			Credit 1.1	Optimize Energy Performance, 20% New / 10% Existing	2
2			Credit 1.2	Optimize Energy Performance, 30% New / 20% Existing	2
2			Credit 1.3	Optimize Energy Performance, 40% New / 30% Existing	2
		2	Credit 1.4	Optimize Energy Performance, 50% New / 40% Existing	2
		2	Credit 1.5	Optimize Energy Performance, 60% New / 50% Existing	2
		1	Credit 2.1	Renewable Energy, 5%	1
		1	Credit 2.2	Renewable Energy, 10%	1
		1	Credit 2.3	Renewable Energy, 20%	1
1			Credit 3	Additional Commissioning	1
1			Credit 4	Elimination of HCFC's and Halons	1
		1	Credit 5	Measurement & Verification	1
1			Credit 6	Green Power	1

7	6	<b>Materials &amp; Resources</b>	Possible Points <b>13</b>
---	---	----------------------------------	---------------------------

Y	?	N			
Y			Prereq 1	Storage & Collection of Recyclables	
		1	Credit 1.1	Building Reuse, Maintain 75% of Existing Shell	1
		1	Credit 1.2	Building Reuse, Maintain 100% of Shell	1
		1	Credit 1.3	Building Reuse, Maintain 100% Shell & 50% Non-Shell	1
1			Credit 2.1	Construction Waste Management, Divert 50%	1
1			Credit 2.2	Construction Waste Management, Divert 75%	1
		1	Credit 3.1	Resource Reuse, Specify 5%	1
		1	Credit 3.2	Resource Reuse, Specify 10%	1
1			Credit 4.1	Recycled Content, Specify 5% (post-consumer + 1/2 post-industrial)	1
1			Credit 4.2	Recycled Content, Specify 10% (post-consumer + 1/2 post-industrial)	1
1			Credit 5.1	Local/Regional Materials, 20% Manufactured Locally	1
1			Credit 5.2	Local/Regional Materials, of 20% Above, 50% Harvested Locally	1
		1	Credit 6	Rapidly Renewable Materials	1
1			Credit 7	Certified Wood	1

8	7	<b>Indoor Environmental Quality</b>	Possible Points <b>15</b>
---	---	-------------------------------------	---------------------------

Y	?	N			
Y			Prereq 1	Minimum IAQ Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
		1	Credit 1	Carbon Dioxide (CO2) Monitoring	1
		1	Credit 2	Ventilation Effectiveness	1
1			Credit 3.1	Construction IAQ Management Plan, During Construction	1
		1	Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials, Adhesives & Sealants	1
1			Credit 4.2	Low-Emitting Materials, Paints	1
1			Credit 4.3	Low-Emitting Materials, Carpet	1
1			Credit 4.4	Low-Emitting Materials, Composite Wood	1
		1	Credit 5	Indoor Chemical & Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems, Perimeter	1
1			Credit 6.2	Controllability of Systems, Non-Perimeter	1
		1	Credit 7.1	Thermal Comfort, Comply with ASHRAE 55-1992	1
		1	Credit 7.2	Thermal Comfort, Permanent Monitoring System	1
		1	Credit 8.1	Daylight & Views, Daylight 75% of Spaces	1
1			Credit 8.2	Daylight & Views, Views for 90% of Spaces	1

5		<b>Innovation &amp; Design Process</b>	Possible Points <b>5</b>
---	--	--	--------------------------

Y	?	N			
1			Credit 1.1	Innovation in Design: 40% Locally Manufactured Materials	1
1			Credit 1.2	Innovation in Design: Green User Education Program	1
1			Credit 1.3	Innovation in Design: Green Housekeeping Plan	1
1			Credit 1.4	Innovation in Design: 40% Water Efficiency	1
1			Credit 2	LEED™ Accredited Professional	1

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# **Green Building Rating System**

**For New Construction &  
Major Renovations**

**(LEED-NC)**

**Version 2.1**

**November 2002**

Revised 3/14/03





## Introduction

The Leadership in Energy and Environmental Design (LEED™) Green Building Rating System represents the U.S. Green Building Council's effort to provide a national standard for what constitutes a "green building." Through its use as a design guideline and third-party certification tool, it aims to improve occupant well-being, environmental performance and economic returns of buildings using established and innovative practices, standards and technologies.

Consistent with USGBC policy for the continuous improvement of LEED, Version 2.1 is an administrative update of the LEED 2.0 Rating System for new commercial construction, major renovations and high-rise residential buildings. Its purpose is to address concerns raised by USGBC members and other LEED users by providing technical clarifications and streamlining the documentation requirements for LEED certification. These improvements are expected to simplify the documentation process for project teams and to reduce the costs of documenting LEED credits while retaining the stringency and integrity of the LEED Version 2.0 standards. An approval vote by USGBC membership is not required for Version 2.1 because performance levels have not been altered. Version 2.1 was created through the generous volunteer efforts of the LEED Technical Advisory Groups and with the guidance of the LEED Steering Committee. This document represents general consensus, not unanimous agreement. USGBC gratefully acknowledges the contributions of its committee members.

The new LEED Letter Template is a central component of the Version 2.1 improvements. It is a dynamic tracking and documentation tool that must be used by Version 2.1 project teams in preparing a complete LEED certification submittal. For each credit, the Letter Template prompts LEED practitioners for data, indicates when documentation requirements have been fulfilled adequately for submittal, and serves as a formatting template for the project's initial submittal. Additional support documents will be requested during the certification assessment's audit phase.

This Rating System document states the basic intent, requirements and documentation submittals that are necessary to achieve each prerequisite and voluntary "credit." Projects earn one or more points toward certification by meeting or exceeding each credit's technical requirements. All prerequisites must be achieved in order to qualify for certification. Points add up to a final score that relates to one of four possible levels of certification. See the LEED Checklist for a summary of credit topics and point values. A short description of technologies and strategies is included for each credit to briefly inform those who are unfamiliar with the particular topic. The LEED Reference Guide for Version 2.1—the technical companion to the Rating System and Letter Template—provides further background, explanations and instructions.



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# Project Checklist

## Sustainable Sites

14 Possible Points

<input checked="" type="checkbox"/>	Prereq 1	<b>Erosion &amp; Sedimentation Control</b>	Required
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 1	<b>Site Selection</b>	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 2	<b>Urban Redevelopment</b>	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 3	<b>Brownfield Redevelopment</b>	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4.1	<b>Alternative Transportation</b> , Public Transportation Access	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4.2	<b>Alternative Transportation</b> , Bicycle Storage & Changing Rooms	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4.3	<b>Alternative Transportation</b> , Alternative Fuel Vehicles	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4.4	<b>Alternative Transportation</b> , Parking Capacity	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 5.1	<b>Reduced Site Disturbance</b> , Protect or Restore Open Space	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 5.2	<b>Reduced Site Disturbance</b> , Development Footprint	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 6.1	<b>Stormwater Management</b> , Rate and Quantity	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 6.2	<b>Stormwater Management</b> , Treatment	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 7.1	<b>Heat Island Effect</b> , Non-Roof	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 7.2	<b>Heat Island Effect</b> , Roof	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 8	<b>Light Pollution Reduction</b>	1

## Water Efficiency

5 Possible Points

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 1.1	<b>Water Efficient Landscaping</b> , Reduce by 50%	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 1.2	<b>Water Efficient Landscaping</b> , No Potable Use or No Irrigation	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 2	<b>Innovative Wastewater Technologies</b>	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 3.1	<b>Water Use Reduction</b> , 20% Reduction	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 3.2	<b>Water Use Reduction</b> , 30% Reduction	1

## Energy & Atmosphere

17 Possible Points

<input checked="" type="checkbox"/>	Prereq 1	<b>Fundamental Building Systems Commissioning</b>	Required
<input checked="" type="checkbox"/>	Prereq 2	<b>Minimum Energy Performance</b>	Required
<input checked="" type="checkbox"/>	Prereq 3	<b>CFC Reduction in HVAC&amp;R Equipment</b>	Required
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 1	<b>Optimize Energy Performance</b>	1–10
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 2.1	<b>Renewable Energy</b> , 5%	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 2.2	<b>Renewable Energy</b> , 10%	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 2.3	<b>Renewable Energy</b> , 20%	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 3	<b>Additional Commissioning</b>	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4	<b>Ozone Depletion</b>	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 5	<b>Measurement &amp; Verification</b>	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 6	<b>Green Power</b>	1



## Materials & Resources

13 Possible Points

<b>Y</b>	Prereq 1	<b>Storage &amp; Collection of Recyclables</b>	Required
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 1.1	<b>Building Reuse</b> , Maintain 75% of Existing Shell	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 1.2	<b>Building Reuse</b> , Maintain 100% of Shell	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 1.3	<b>Building Reuse</b> , Maintain 100% Shell & 50% Non-Shell	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 2.1	<b>Construction Waste Management</b> , Divert 50%	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 2.2	<b>Construction Waste Management</b> , Divert 75%	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 3.1	<b>Resource Reuse</b> , Specify 5%	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 3.2	<b>Resource Reuse</b> , Specify 10%	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4.1	<b>Recycled Content</b> , Specify 5% (p.c. + 1/2 p.i.)	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4.2	<b>Recycled Content</b> , Specify 10% (p.c. + 1/2 p.i.)	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 5.1	<b>Local/Regional Materials</b> , 20% Manufactured Locally	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 5.2	<b>Local/Regional Materials</b> , of 20% in MRc5.1, 50% Harvested Locally	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 6	<b>Rapidly Renewable Materials</b>	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 7	<b>Certified Wood</b>	1

## Indoor Environmental Quality

15 Possible Points

<b>Y</b>	Prereq 1	<b>Minimum IAQ Performance</b>	Required
<b>Y</b>	Prereq 2	<b>Environmental Tobacco Smoke (ETS) Control</b>	Required
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 1	<b>Carbon Dioxide (CO<sub>2</sub>) Monitoring</b>	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 2	<b>Ventilation Effectiveness</b>	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 3.1	<b>Construction IAQ Management Plan</b> , During Construction	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 3.2	<b>Construction IAQ Management Plan</b> , Before Occupancy	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4.1	<b>Low-Emitting Materials</b> , Adhesives & Sealants	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4.2	<b>Low-Emitting Materials</b> , Paints	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4.3	<b>Low-Emitting Materials</b> , Carpet	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4.4	<b>Low-Emitting Materials</b> , Composite Wood	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 5	<b>Indoor Chemical &amp; Pollutant Source Control</b>	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 6.1	<b>Controllability of Systems</b> , Perimeter	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 6.2	<b>Controllability of Systems</b> , Non-Perimeter	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 7.1	<b>Thermal Comfort</b> , Comply with ASHRAE 55-1992	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 7.2	<b>Thermal Comfort</b> , Permanent Monitoring System	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 8.1	<b>Daylight &amp; Views</b> , Daylight 75% of Spaces	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 8.2	<b>Daylight &amp; Views</b> , Views for 90% of Spaces	1

## Innovation & Design Process

5 Possible Points

<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 1.1	<b>Innovation in Design</b>	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 1.2	<b>Innovation in Design</b>	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 1.3	<b>Innovation in Design</b>	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 1.4	<b>Innovation in Design</b>	1
<b>Y</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 2	<b>LEED™ Accredited Professional</b>	1

## Project Totals

69 Possible Points

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>Certified</b> 26-32 points	<b>Silver</b> 33-38 points	<b>Gold</b> 39-51 points	<b>Platinum</b> 52-69 points
--	-------------------------------	----------------------------	--------------------------	------------------------------

# Sustainable Sites

SS	WE	EA	MR	EQ	ID
Prerequisite 1					

## Erosion & Sedimentation Control

---

Required

### Intent

Control erosion to reduce negative impacts on water and air quality.

### Requirements

Design a sediment and erosion control plan, specific to the site, that conforms to United States Environmental Protection Agency (EPA) Document No. EPA 832/R-92-005 (September 1992), Storm Water Management for Construction Activities, Chapter 3, OR local erosion and sedimentation control standards and codes, whichever is more stringent. The plan shall meet the following objectives:

- Prevent loss of soil during construction by stormwater runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- Prevent sedimentation of storm sewer or receiving streams.
- Prevent polluting the air with dust and particulate matter.

### Submittals

- ❑ Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring whether the project follows local erosion and sedimentation control standards or the referenced EPA standard. Provide a brief list of the measures implemented. If local standards and codes are followed, describe how they meet or exceed the referenced EPA standard.

### Potential Technologies & Strategies

Adopt an erosion and sediment control plan for the project site during construction. Consider employing strategies such as temporary and permanent seeding, mulching, earth dikes, silt fencing, sediment traps and sediment basins.

SS	WE	EA	MR	EQ	ID
Credit 1					

1 Point

## Site Selection

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### Intent

Avoid development of inappropriate sites and reduce the environmental impact from the location of a building on a site.

### Requirements

Do not develop buildings, roads or parking areas on portions of sites that meet any one of the following criteria:

- Prime farmland as defined by the United States Department of Agriculture in the United States Code of Federal Regulations, Title 7, Volume 6, Parts 400 to 699, Section 657.5 (citation 7CFR657.5).
- Land whose elevation is lower than 5 feet above the elevation of the 100-year flood as defined by the Federal Emergency Management Agency (FEMA).
- Land which is specifically identified as habitat for any species on Federal or State threatened or endangered lists.
- Within 100 feet of any water including wetlands as defined by United States Code of Federal Regulations 40 CFR, Parts 230-233 and Part 22, and isolated wetlands or areas of special concern identified by state or local rule, OR greater than distances given in state or local regulations as defined by local or state rule or law, whichever is more stringent.
- Land which prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is accepted in trade by the public landowner (Park Authority projects are exempt).

### Submittals

- ☐ Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring that the project site meets the credit requirements.

### Potential Technologies & Strategies

During the site selection process, give preference to those sites that do not include sensitive site elements and restrictive land types. Select a suitable building location and design the building with the minimal footprint to minimize site disruption. Strategies include stacking the building program, tuck-under parking, and sharing facilities with neighbors.

## Development Density

---

1 Point

### Intent

Channel development to urban areas with existing infrastructure, protect greenfields and preserve habitat and natural resources.

### Requirements

Increase localized density to conform to existing or desired density goals by utilizing sites that are located within an existing minimum development density of 60,000 square feet per acre (two story downtown development).

### Submittals

- ☐ Provide the LEED Letter Template, signed by the civil engineer, architect or other responsible party, declaring that the project has achieved the required development densities. Provide density for the project and for the surrounding area.
- ☐ Provide an area plan with the project location highlighted.

### Potential Technologies & Strategies

During the site selection process, give preference to urban sites.



SS	WE	EA	MR	EQ	ID
Credit 3					

1 Point

## Brownfield Redevelopment

---

### Intent

Rehabilitate damaged sites where development is complicated by real or perceived environmental contamination, reducing pressure on undeveloped land.

### Requirements

Develop on a site documented as contaminated (by means of an ASTM E1903-97 Phase II Environmental Site Assessment) OR on a site classified as a brownfield by a local, state or federal government agency. Effectively remediate site contamination.

### Submittals

- ☐ Provide a copy of the pertinent sections of the ASTM E1903-97 Phase II Environmental Site Assessment documenting the site contamination OR provide a letter from a local, state or federal regulatory agency confirming that the site is classified as a brownfield by that agency.
- ☐ Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring the type of damage that existed on the site and describing the remediation performed.

### Potential Technologies & Strategies

During the site selection process, give preference to brownfield sites. Identify tax incentives and property cost savings. Develop and implement a site remediation plan using strategies such as pump-and-treat, bioreactors, land farming and in-situ remediation.

## **Alternative Transportation: Public Transportation Access**

---

1 Point

### **Intent**

Reduce pollution and land development impacts from automobile use.

### **Requirements**

Locate project within 1/2 mile of a commuter rail, light rail or subway station or 1/4 mile of two or more public or campus bus lines usable by building occupants.

### **Submittals**

- ☐ Provide the LEED Letter Template, signed by an appropriate party, declaring that the project building(s) are located within required proximity to mass transit.
- ☐ Provide an area drawing or transit map highlighting the building location and the fixed rail stations and bus lines, and indicate the distances between them. Include a scale bar for distance measurement.

### **Potential Technologies & Strategies**

Perform a transportation survey of future building occupants to identify transportation needs. Site the building near mass transit.

SS	WE	EA	MR	EQ	ID
Credit 4.2					

1 Point

## Alternative Transportation: Bicycle Storage & Changing Rooms

---

### Intent

Reduce pollution and land development impacts from automobile use.

### Requirements

For commercial or institutional buildings, provide secure bicycle storage with convenient changing/shower facilities (within 200 yards of the building) for 5% or more of regular building occupants. For residential buildings, provide covered storage facilities for securing bicycles for 15% or more of building occupants in lieu of changing/shower facilities.

### Submittals

- ☐ For commercial projects: provide the LEED Letter Template, signed by the Architect or responsible party, declaring the distance to bicycle storage and showers from the building entrance and demonstrating that these facilities can accommodate at least 5% of building occupants.

OR

- ☐ For residential projects: provide the LEED Letter Template, signed by the architect or responsible party, declaring the design occupancy for the buildings, number of covered bicycle storage facilities for securing bicycles, and demonstrating that these facilities can accommodate at least 15% of building occupants.

### Potential Technologies & Strategies

Design the building with transportation amenities such as bicycle racks and showering/changing facilities.

## **Alternative Transportation: Alternative Fuel Vehicles**

---

1 Point

### **Intent**

Reduce pollution and land development impacts from automobile use.

### **Requirements**

Provide alternative fuel vehicles for 3% of building occupants AND provide preferred parking for these vehicles, OR install alternative-fuel refueling stations for 3% of the total vehicle parking capacity of the site. Liquid or gaseous fueling facilities must be separately ventilated or located outdoors.

### **Submittals**

- ☐ Provide the LEED Letter Template and proof of ownership of, or 2 year lease agreement for, alternative fuel vehicles and calculations indicating that alternative fuel vehicles will serve 3% of building occupants. Provide site drawings or parking plan highlighting preferred parking for alternative fuel vehicles.

OR

- ☐ Provide the LEED Letter Template with specifications and site drawings highlighting alternative-fuel refueling stations. Provide calculations demonstrating that these facilities accommodate 3% or more of the total vehicle parking capacity.

### **Potential Technologies & Strategies**

Provide transportation amenities such as alternative fuel refueling stations and carpool/vanpool programs. Consider sharing the costs and benefits of refueling stations with neighbors.



SS	WE	EA	MR	EQ	ID
<b>Credit 4.4</b>					

1 Point

## **Alternative Transportation: Parking Capacity**

---

### **Intent**

Reduce pollution and land development impacts from single occupancy vehicle use.

### **Requirements**

Size parking capacity to meet, but not exceed, minimum local zoning requirements AND provide preferred parking for carpools or vanpools capable of serving 5% of the building occupants; OR add no new parking for rehabilitation projects AND provide preferred parking for carpools or vanpools capable of serving 5% of the building occupants.

### **Submittals**

- ☐ For new projects: provide the LEED Letter Template, signed by the civil engineer or responsible party, stating any relevant minimum zoning requirements and declaring that parking capacity is sized to meet, but not exceed them. State the number of preferred parking spaces for carpools.
- OR
- ☐ For rehabilitation projects: provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring that no new parking capacity has been added. State the number of preferred parking spaces for carpools.

### **Potential Technologies & Strategies**

Minimize parking lot/garage size. Consider sharing parking facilities with adjacent buildings.

## Reduced Site Disturbance: Protect or Restore Open Space

1 Point

### Intent

Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

### Requirements

On greenfield sites, limit site disturbance including earthwork and clearing of vegetation to 40 feet beyond the building perimeter, 5 feet beyond primary roadway curbs, walkways and main utility branch trenches, and 25 feet beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities and playing fields) that require additional staging areas in order to limit compaction in the constructed area; OR, on previously developed sites, restore a minimum of 50% of the site area (excluding the building footprint) by replacing impervious surfaces with native or adapted vegetation.

### Submittals

- ☐ For greenfield sites: provide the LEED Letter Template, signed by the civil engineer or responsible party, demonstrating and declaring that site disturbance (including earthwork and clearing of vegetation) has been limited to 40 feet beyond the building perimeter, 5 feet beyond primary roadway curbs, walk ways and main utility branch trenches, and 25 feet beyond constructed areas with permeable surfaces. Provide site drawings and specifications highlighting limits of construction disturbance.

OR

- ☐ For previously developed sites: provide a LEED Letter Template, signed by the civil engineer or responsible party, declaring and describing restoration of degraded habitat areas. Include highlighted site drawings with area calculations demonstrating that 50% of the site area that does not fall within the building footprint has been restored.

### Potential Technologies & Strategies

Perform a site survey to identify site elements and adopt a master plan for development of the project site. Select a suitable building location and design the building with a minimal footprint to minimize site disruption. Strategies include stacking the building program, tuck-under parking and sharing facilities with neighbors. Establish clearly marked construction boundaries to minimize disturbance of the existing site and restore previously degraded areas to their natural state.

SS	WE	EA	MR	EQ	ID
Credit 5.2					

1 Point

## Reduced Site Disturbance: Development Footprint

---

### Intent

Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

### Requirements

Reduce the development footprint (defined as entire building footprint, access roads and parking) to exceed the local zoning's open space requirement for the site by 25%. For areas with no local zoning requirements (e.g., some university campuses and military bases), designate open space area adjacent to the building that is equal to the development footprint.

### Submittals

- ☐ Provide a copy of the local zoning requirements highlighting the criteria for open space. Provide the LEED Letter Template, signed by the civil engineer or responsible party, demonstrating and declaring that the open space exceeds the local zoning open space requirement for the site by 25%.

OR

- ☐ For areas with no local zoning requirements (e.g., some university campuses and military bases), designate open space area adjacent to the building that is equal to the development footprint. Provide a letter from the property owner stating that the open space will be conserved for the life of the building.

### Potential Technologies & Strategies

Perform a site survey to identify site elements and adopt a master plan for development of the project site. Select a suitable building location and design the building with a minimal footprint to minimize site disruption. Strategies include stacking the building program, tuck-under parking and sharing facilities with neighbors. Establish clearly marked construction boundaries to minimize disturbance of existing and restore previously degraded areas to their natural state.

## **Stormwater Management: Rate and Quantity**

---

1 Point

### **Intent**

Limit disruption and pollution of natural water flows by managing stormwater runoff.

### **Requirements**

If existing imperviousness is less than or equal to 50%, implement a stormwater management plan that prevents the post-development 1.5 year, 24 hour peak discharge rate from exceeding the pre-development 1.5 year, 24 hour peak discharge rate.

OR

If existing imperviousness is greater than 50%, implement a stormwater management plan that results in a 25% decrease in the rate and quantity of stormwater runoff.

### **Submittals**

- ☐ Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring that the post-development 1.5 year, 24 hour peak discharge rate does not exceed the pre-development 1.5 year 24 hour peak discharge rate. Include calculations demonstrating that existing site imperviousness is less than or equal to 50%.

OR

- ☐ Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring and demonstrating that the stormwater management strategies result in at least a 25% decrease in the rate and quantity of stormwater runoff. Include calculations demonstrating that existing site imperviousness exceeds 50%.

### **Potential Technologies & Strategies**

Design the project site to maintain natural stormwater flows by promoting infiltration. Specify garden roofs and pervious paving to minimize impervious surfaces. Reuse stormwater volumes generated for non-potable uses such as landscape irrigation, toilet and urinal flushing and custodial uses.



SS	WE	EA	MR	EQ	ID
Credit 6.2					

1 Point

## Stormwater Management: Treatment

---

### Intent

Limit disruption of natural water flows by eliminating stormwater runoff, increasing on-site infiltration and eliminating contaminants.

### Requirements

Construct site stormwater treatment systems designed to remove 80% of the average annual post-development total suspended solids (TSS) and 40% of the average annual post-development total phosphorous (TP) based on the average annual loadings from all storms less than or equal to the 2-year/24-hour storm. Do so by implementing Best Management Practices (BMPs) outlined in Chapter 4, Part 2 (Urban Runoff), of the United States Environmental Protection Agency's (EPA's) *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*, January 1993 (Document No. EPA-840-B-92-002) or the local government's BMP document (whichever is more stringent).

### Submittals

- ☐ Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring that the design complies with or exceeds EPA or local government Best Management Practices (whichever set is more stringent) for removal of total suspended solids and total phosphorous.

### Potential Technologies & Strategies

Design mechanical or natural treatment systems such as constructed wetlands, vegetated filter strips and bioswales to treat the site's stormwater.

## Heat Island Effect: Non-Roof

---

1 Point

### Intent

Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

### Requirements

Provide shade (within 5 years) and/or use light-colored/high-albedo materials (reflectance of at least 0.3) and/or open grid pavement for at least 30% of the site's non-roof impervious surfaces, including parking lots, walkways, plazas, etc.; OR place a minimum of 50% of parking spaces underground or covered by structured parking; OR use an open-grid pavement system (less than 50% impervious) for a minimum of 50% of the parking lot area.

### Submittals

- ❑ Provide the LEED Letter Template, signed by the civil engineer or responsible party, referencing the site plan to demonstrate areas of paving, landscaping (list species) and building footprint, and declaring that:
  - ❑ A minimum of 30% of non-roof impervious surfaces areas are constructed with high-albedo materials and/or open grid pavement and/or will be shaded within five years
  - ❑ OR a minimum of 50% of parking spaces have been placed underground or are covered by structured parking
  - ❑ OR an open-grid pavement system (less than 50% impervious) has been used for a minimum of 50% of the parking lot area.

### Potential Technologies & Strategies

Shade constructed surfaces on the site with landscape features and minimize the overall building footprint. Consider replacing constructed surfaces (i.e. roof, roads, sidewalks, etc.) with vegetated surfaces such as garden roofs and open grid paving or specify high-albedo materials to reduce the heat absorption.

SS	WE	EA	MR	EQ	ID
<b>Credit 7.2</b>					

1 Point

## Heat Island Effect: Roof

---

### Intent

Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

### Requirements

Use ENERGY STAR® compliant (highly reflective) AND high emissivity roofing (emissivity of at least 0.9 when tested in accordance with ASTM 408) for a minimum of 75% of the roof surface; OR install a “green” (vegetated) roof for at least 50% of the roof area. Combinations of high albedo and vegetated roof can be used providing they collectively cover 75% of the roof area.

### Submittals

- ☐ Provide the LEED Letter Template, signed by the architect, civil engineer or responsible party, referencing the building plan and declaring that the roofing materials comply with the ENERGY STAR® Label requirements and have a minimum emissivity of 0.9. Demonstrate that high-albedo and vegetated roof areas combined constitute at least 75% of the total roof area.

OR

- ☐ Provide the LEED Letter Template, signed by the architect, civil engineer or responsible party, referencing the building plan and demonstrating that vegetated roof areas constitute at least 50% of the total roof area.

### Potential Technologies & Strategies

Visit the ENERGY STAR® Web site, [www.energystar.gov](http://www.energystar.gov), to look for compliant products. Consider installing high-albedo and vegetated roofs to reduce heat absorption.

## Light Pollution Reduction

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1 Point

### Intent

Eliminate light trespass from the building and site, improve night sky access and reduce development impact on nocturnal environments.

### Requirements

Meet or provide lower light levels and uniformity ratios than those recommended by the Illuminating Engineering Society of North America (IESNA) *Recommended Practice Manual: Lighting for Exterior Environments* (RP-33-99). Design exterior lighting such that all exterior luminaires with more than 1000 initial lamp lumens are shielded and all luminaires with more than 3500 initial lamp lumens meet the Full Cutoff IESNA Classification. The maximum candela value of all interior lighting shall fall within the building (not out through windows) and the maximum candela value of all exterior lighting shall fall within the property. Any luminaire within a distance of 2.5 times its mounting height from the property boundary shall have shielding such that no light from that luminaire crosses the property boundary.

### Submittals

- ☐ Provide the LEED Letter Template, signed by an appropriate party, declaring that the credit requirements have been met.

### Potential Technologies & Strategies

Adopt site lighting criteria to maintain safe light levels while avoiding off-site lighting and night sky pollution. Minimize site lighting where possible and model the site lighting using a computer model. Technologies to reduce light pollution include full cutoff luminaires, low-reflectance surfaces and low-angle spotlights.



SS	<b>WE</b>	EA	MR	EQ	ID
Credit 1.1					

# Water Efficiency

1 Point

## **Water Efficient Landscaping:** Reduce by 50%

---

### **Intent**

Limit or eliminate the use of potable water for landscape irrigation.

### **Requirements**

Use high-efficiency irrigation technology OR use captured rain or recycled site water to reduce potable water consumption for irrigation by 50% over conventional means.

### **Submittals**

- ☐ Provide the LEED Letter Template, signed by the architect, engineer or responsible party, declaring that potable water consumption for site irrigation has been reduced by 50%. Include a brief narrative of the equipment used and/or the use of drought-tolerant or native plants.

### **Potential Technologies & Strategies**

Perform a soil/climate analysis to determine appropriate landscape types and design the landscape with indigenous plants to reduce or eliminate irrigation requirements. Use high-efficiency irrigation systems and consider using stormwater and/or greywater for irrigation.

SS	<b>WE</b>	EA	MR	EQ	ID
<b>Credit 1.2</b>					

## **Water Efficient Landscaping:** **No Potable Use or No Irrigation**

---

1 Point  
in addition to  
WE 1.1

### **Intent**

Limit or eliminate the use of potable water for landscape irrigation.

### **Requirements**

Use only captured rain or recycled site water to eliminate all potable water use for site irrigation (except for initial watering to establish plants), OR do not install permanent landscape irrigation systems.

### **Submittals**

- ☐ Provide the LEED Letter Template, signed by the responsible architect and/or engineer, declaring that the project site will not use potable water for irrigation. Include a narrative describing the captured rain system, the recycled site water system, and their holding capacity. List all the plant species used. Include calculations demonstrating that irrigation requirements can be met from captured rain or recycled site water.

OR

- ☐ Provide the LEED Letter Template, signed by the landscape architect or responsible party, declaring that the project site does not have a permanent landscape irrigation system. Include a narrative describing how the landscape design allows for this.

### **Potential Technologies & Strategies**

Perform a soil/climate analysis to determine appropriate landscape types and design the landscape with indigenous plants to reduce or eliminate irrigation requirements. Consider using stormwater and/or greywater for irrigation.

SS	<b>WE</b>	EA	MR	EQ	ID
<b>Credit 2</b>					

1 Point

## Innovative Wastewater Technologies

---

### Intent

Reduce generation of wastewater and potable water demand, while increasing the local aquifer recharge.

### Requirements

Reduce the use of municipally provided potable water for building sewage conveyance by a minimum of 50%, OR treat 100% of wastewater on site to tertiary standards.

### Submittals

- ☐ Provide the LEED Letter Template, signed by the architect, MEP engineer or responsible party, declaring that water for building sewage conveyance will be reduced by at least 50%. Include the spreadsheet calculation and a narrative demonstrating the measures used to reduce wastewater by at least 50% from baseline conditions.

OR

- ☐ Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring that 100% of wastewater will be treated to tertiary standards on site. Include a narrative describing the on-site wastewater treatment system.

### Potential Technologies & Strategies

Specify high-efficiency fixtures and dry fixtures such as composting toilets and waterless urinals to reduce wastewater volumes. Consider reusing stormwater or greywater for sewage conveyance or on-site wastewater treatment systems (mechanical and/or natural).

## Water Use Reduction: 20% Reduction

---

1 Point

### Intent

Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

### Requirements

Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting the Energy Policy Act of 1992 fixture performance requirements.

### Submittals

- ☐ Provide the LEED Letter Template, signed by the MEP engineer or responsible party, declaring that the project uses 20% less water than the baseline fixture performance requirements of the Energy Policy Act of 1992.
- ☐ Provide the spreadsheet calculation demonstrating that water-consuming fixtures specified for the stated occupancy and use of the building reduce occupancy-based potable water consumption by 20% compared to baseline conditions.

### Potential Technologies & Strategies

Estimate the potable and non-potable water needs for the building. Use high-efficiency fixtures, dry fixtures such as composting toilets and waterless urinals, and occupant sensors to reduce the potable water demand. Consider reuse of stormwater and greywater for non-potable applications such as toilet and urinal flushing, mechanical systems and custodial uses.

SS	<b>WE</b>	EA	MR	EQ	ID
<b>Credit 3.2</b>					

1 Point  
in addition to  
WE 3.1

## **Water Use Reduction: 30% Reduction**

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### **Intent**

Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

### **Requirements**

Employ strategies that in aggregate use 30% less water than the water use baseline calculated for the building (not including irrigation) after meeting the Energy Policy Act of 1992 fixture performance requirements.

### **Submittals**

- ☐ Provide the LEED Letter Template, signed by the MEP engineer or responsible party, declaring that the project uses 30% less water than the baseline fixture performance requirements of the Energy Policy Act of 1992.
- ☐ Provide the spreadsheet calculation demonstrating that water-consuming fixtures specified for the stated occupancy and use of the building reduce occupancy-based potable water consumption by 30% compared to baseline conditions.

### **Potential Technologies & Strategies**

Estimate the potable and non-potable water needs for the building. Use high-efficiency fixtures, dry fixtures such as composting toilets and waterless urinals, and occupant sensors to reduce the potable water demand. Consider reuse of stormwater and greywater for non-potable applications such as toilet and urinal flushing, mechanical systems and custodial uses.



# Energy & Atmosphere

SS	WE	EA	MR	EQ	ID
Prerequisite 1					

## Fundamental Building Systems Commissioning

---

Required

### Intent

Verify and ensure that fundamental building elements and systems are designed, installed and calibrated to operate as intended.

### Requirements

Implement or have a contract in place to implement the following fundamental best practice commissioning procedures.

- Engage a commissioning team that does not include individuals directly responsible for project design or construction management.
- Review the design intent and the basis of design documentation.
- Incorporate commissioning requirements into the construction documents.
- Develop and utilize a commissioning plan.
- Verify installation, functional performance, training and operation and maintenance documentation.
- Complete a commissioning report.

### Submittals

- ❑ Provide the LEED Letter Template, signed by the owner or commissioning agent(s), confirming that the fundamental commissioning requirements have been successfully executed or will be provided under existing contract(s).

### Potential Technologies & Strategies:

Engage a commissioning authority and adopt a commissioning plan. Include commissioning requirements in bid documents and task the commissioning agent to produce a commissioning report once commissioning activities are completed.

SS	WE	<b>EA</b>	MR	EQ	ID
<b>Prerequisite 2</b>					

Required

## Minimum Energy Performance

---

### Intent

Establish the minimum level of energy efficiency for the base building and systems.

### Requirements

Design the building to comply with ASHRAE/IESNA Standard 90.1-1999 (without amendments) or the local energy code, whichever is more stringent.

### Submittals

- ❑ Provide a LEED Letter Template, signed by a licensed professional engineer or architect, stating that the building complies with ASHRAE/IESNA 90.1-1999 or local energy codes. If local energy codes were applied, demonstrate that the local code is equivalent to, or more stringent than, ASHRAE/IESNA 90.1-1999 (without amendments).

### Potential Technologies & Strategies:

Design the building envelope and systems to maximize energy performance. Use a computer simulation model to assess the energy performance and identify the most cost effective energy measures. Quantify energy performance compared to the baseline building.

## CFC Reduction in HVAC&R Equipment

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Required

### Intent

Reduce ozone depletion.

### Requirements

Zero use of CFC-based refrigerants in new base building HVAC&R systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phase-out conversion.

### Submittals

- ☐ Provide a LEED Letter Template, signed by a licensed professional engineer or architect, declaring that the building's HVAC&R systems do not use CFC-based refrigerants.

### Potential Technologies & Strategies:

When reusing existing HVAC systems, conduct an inventory to identify equipment that uses CFC refrigerants and adopt a replacement schedule for these refrigerants. For new buildings, specify new HVAC equipment that uses no CFC refrigerants.

SS	WE	EA	MR	EQ	ID
Credit 1					

1–10 Points

## Optimize Energy Performance

---

### Intent

Achieve increasing levels of energy performance above the prerequisite standard to reduce environmental impacts associated with excessive energy use.

### Requirements

Reduce design energy cost compared to the energy cost budget for energy systems regulated by ASHRAE/IESNA Standard 90.1-1999 (without amendments), as demonstrated by a whole building simulation using the Energy Cost Budget Method described in Section 11 of the Standard.

New Bldgs.	Existing Bldgs.	Points
15%	5%	1
20%	10%	2
25%	15%	3
30%	20%	4
35%	25%	5
40%	30%	6
45%	35%	7
50%	40%	8
55%	45%	9
60%	50%	10

Regulated energy systems include HVAC (heating, cooling, fans and pumps), service hot water and interior lighting. Non-regulated systems include plug loads, exterior lighting, garage ventilation and elevators (vertical transportation). Two methods may be used to separate energy consumption for regulated systems. The energy consumption for each fuel may be prorated according to the fraction of energy used by regulated and non-regulated energy. Alternatively, separate meters (accounting) may be created in the energy simulation program for regulated and non-regulated energy uses.

If an analysis has been made comparing the proposed design to local energy standards and a defensible equivalency (at minimum) to ASHRAE/IESNA Standard 90.1-1999 has been established, then the comparison against the local code may be used in lieu of the ASHRAE Standard.

Project teams are encouraged to apply for innovation credits if the energy consumption of non-regulated systems is also reduced.

SS	WE	EA	MR	EQ	ID
Credit 1					

## Optimize Energy Performance

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1–10 Points

(continued)

### Submittals

- ☐ Complete the LEED Letter Template incorporating a quantitative summary table showing the energy saving strategies incorporated in the building design.
- ☐ Demonstrate via summary printout from energy simulation software that the design energy cost is less than the energy cost budget as defined in ASHRAE/IESNA 90.1-1999, Section 11.

### Potential Technologies & Strategies

Design the building envelope and building systems to maximize energy performance. Use a computer simulation model to assess the energy performance and identify the most cost-effective energy efficiency measures. Quantify energy performance as compared to a baseline building.



SS	WE	EA	MR	EQ	ID
<b>Credit 2.1</b>					

1 Point

## **Renewable Energy: 5%**

---

### **Intent**

Encourage and recognize increasing levels of on-site renewable energy self-supply in order to reduce environmental impacts associated with fossil fuel energy use.

### **Requirements**

Supply at least 5% of the building's total energy use (as expressed as a fraction of annual energy cost) through the use of on-site renewable energy systems.

### **Submittals**

- ☐ Provide the LEED Letter Template, signed by the architect, owner or responsible party, declaring that at least 5% of the building's energy is provided by on-site renewable energy. Include a narrative describing on-site renewable energy systems installed in the building and calculations demonstrating that at least 5% of total energy costs are supplied by the renewable energy system(s).

### **Potential Technologies & Strategies**

Assess the project for non-polluting and renewable energy potential including solar, wind, geothermal, low-impact hydro, biomass and bio-gas strategies. When applying these strategies, take advantage of net metering with the local utility.

SS	WE	EA	MR	EQ	ID
Credit 2.2					

## Renewable Energy: 10%

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1 Point  
in addition to  
EA 2.1

### Intent

Encourage and recognize increasing levels of self-supply through renewable technologies to reduce environmental impacts associated with fossil fuel energy use.

### Requirements

Supply at least 10% of the building's total energy use (as expressed as a fraction of annual energy cost) through the use of on-site renewable energy systems.

### Submittals

- ❑ Provide the LEED Letter Template, signed by the architect, owner or responsible party, declaring that at least 10% of the building's energy is provided by on-site renewable energy. Include a narrative describing on-site renewable energy systems installed in the building and calculations demonstrating that at least 10% of total energy costs are supplied by the renewable energy system(s).

### Potential Technologies & Strategies

Assess the project for non-polluting renewable energy potential including solar, wind, geothermal, low-impact hydro, biomass and bio-gas strategies. When applying these strategies, take advantage of net metering with the local utility.

SS	WE	EA	MR	EQ	ID
<b>Credit 2.3</b>					

1 Point  
in addition to  
EA 2.1 and 2.2

## **Renewable Energy: 20%**

---

### **Intent**

Encourage and recognize increasing levels of self-supply through renewable technologies to reduce environmental impacts associated with fossil fuel energy use.

### **Requirements**

Supply at least 20% of the building's total energy use (as expressed as a fraction of annual energy cost) through the use of on-site renewable energy systems.

### **Submittals**

- ☐ Provide the LEED Letter Template, signed by the architect, owner or responsible party, declaring that at least 20% of the building's energy is provided by on-site renewable energy. Include a narrative describing on-site renewable energy systems installed in the building and calculations demonstrating that at least 20% of total energy costs are supplied by the renewable energy system(s).

### **Potential Technologies & Strategies**

Assess the project for non-polluting and renewable energy potential including solar, wind, geothermal, low-impact hydro, biomass and bio-gas strategies. When applying these strategies, take advantage of net metering with the local utility.

SS	WE	EA	MR	EQ	ID
<b>Credit 3</b>					

## Additional Commissioning

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1 Point

### Intent

Verify and ensure that the entire building is designed, constructed and calibrated to operate as intended.

### Requirements

In addition to the Fundamental Building Commissioning prerequisite, implement or have a contract in place to implement the following additional commissioning tasks:

1. A commissioning authority independent of the design team shall conduct a review of the design prior to the construction documents phase.
2. An independent commissioning authority shall conduct a review of the construction documents near completion of the construction document development and prior to issuing the contract documents for construction.
3. An independent commissioning authority shall review the contractor submittals relative to systems being commissioned.
4. Provide the owner with a single manual that contains the information required for re-commissioning building systems.
5. Have a contract in place to review building operation with O&M staff, including a plan for resolution of outstanding commissioning-related issues within one year after construction completion date.

### Submittals

- ☐ Provide the LEED Letter Template, signed by the owner or independent commissioning agent(s) as appropriate, confirming that the required additional commissioning tasks have been successfully executed or will be provided under existing contract(s).

### Potential Technologies & Strategies

Engage the commissioning authority early in the design phases.

SS	WE	EA	MR	EQ	ID
<b>Credit 4</b>					

1 Point

## Ozone Protection

---

### Intent

Reduce ozone depletion and support early compliance with the Montreal Protocol.

### Requirements

Install base building level HVAC and refrigeration equipment and fire suppression systems that do not contain HCFCs or Halons.

### Submittals

- ☐ Provide the LEED Letter Template, signed by the architect or engineer, stating that HVAC&R systems as-built are free of HCFCs and Halons.

### Potential Technologies & Strategies

When reusing buildings, inventory existing building systems using refrigerants and fire suppression chemicals and replace those that contain HCFCs or Halons. For new buildings, specify refrigeration and fire suppression systems that use no HCFCs or Halons.

## Measurement and Verification

---

1 Point

### Intent

Provide for the ongoing accountability and optimization of building energy and water consumption performance over time.

### Requirements

Install continuous metering equipment for the following end-uses:

- Lighting systems and controls
- Constant and variable motor loads
- Variable frequency drive (VFD) operation
- Chiller efficiency at variable loads (kW/ton)
- Cooling load
- Air and water economizer and heat recovery cycles
- Air distribution static pressures and ventilation air volumes
- Boiler efficiencies
- Building-related process energy systems and equipment
- Indoor water risers and outdoor irrigation systems

Develop a Measurement and Verification plan that incorporates the monitoring information from the above end-uses and is consistent with Option B, C or D of the 2001 *International Performance Measurement & Verification Protocol (IPMVP) Volume I: Concepts and Options for Determining Energy and Water Savings*.

### Submittals

- ☐ Provide the LEED Letter Template, signed by the licensed engineer or other responsible party, indicating that metering equipment has been installed for each end-use and declaring the option to be followed under IPMVP version 2001.
- ☐ Provide a copy of the M&V plan following IPMVP, 2001 version, including an executive summary.

### Potential Technologies & Strategies

Model the energy and water systems to predict savings. Design the building with equipment to measure energy and water performance. Draft a Measurement & Verification Plan to apply during building operation that compares predicted savings to those actually achieved in the field.



SS	WE	<b>EA</b>	MR	EQ	ID
<b>Credit 6</b>					

1 Point

## Green Power

---

### Intent

Encourage the development and use of grid-source, renewable energy technologies on a net zero pollution basis.

### Requirements

Provide at least 50% of the building's electricity from renewable sources by engaging in at least a two-year renewable energy contract. Renewable sources are as defined by the Center for Resource Solutions (CRS) Green-e products certification requirements.

### Submittals

- ☐ Provide the LEED Letter Template, signed by the owner or other responsible party, documenting that the supplied renewable power is equal to 50% of the project's energy consumption and the sources meet the Green-e definition of renewable energy.
- ☐ Provide a copy of the two-year electric utility purchase contract for power generated from renewable sources.

### Potential Technologies & Strategies

Determine the energy needs of the building and investigate opportunities to engage in a green power contract with the local utility. Green power is derived from solar, wind, geothermal, biomass or low-impact hydro sources. Green power may be procured from a Green-e certified power marketer, a Green-e accredited utility program, through Green-e certified Tradable Renewable Certificates, or from a supply that meets the Green-e renewable power definition. Visit [www.green-e.org](http://www.green-e.org) for details about the Green-e program.

# Materials & Resources

SS	WE	EA	MR	EQ	ID
Prerequisite 1					

## Storage & Collection of Recyclables

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Required

### Intent

Facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills.

### Requirements

Provide an easily accessible area that serves the entire building and is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, corrugated cardboard, glass, plastics and metals.

### Submittals

- ☐ Provide the LEED Letter Template, signed by the architect or owner, declaring that the area dedicated to recycling is easily accessible and accommodates the building's recycling needs.
- ☐ Provide a plan showing the area(s) dedicated to recycled material collection and storage.

### Potential Technologies & Strategies

Designate an area for recyclable collection and storage that is appropriately sized and located in a convenient area. Identify local waste handlers and buyers for glass, plastic, office paper, newspaper, cardboard and organic wastes. Instruct occupants on building recycling procedures. Consider employing cardboard balers, aluminum can crushers, recycling chutes and other waste management technologies to further enhance the recycling program.

SS	WE	EA	MR	EQ	ID
Credit 1.1					

1 Point

## **Building Reuse:**

### **Maintain 75% of Existing Walls, Floors and Roof**

---

#### **Intent**

Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

#### **Requirements**

Maintain at least 75% of existing building structure and shell (exterior skin and framing, excluding window assemblies and non-structural roofing material).

#### **Submittals**

- ☐ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, listing the retained elements and declaring that the credit requirements have been met.

#### **Potential Technologies & Strategies**

Consider reuse of existing buildings, including structure, shell and non-shell elements. Remove elements that pose contamination risk to building occupants and upgrade outdated components such as windows, mechanical systems and plumbing fixtures. Quantify the extent of building reuse.

SS	WE	EA	MR	EQ	ID
<b>Credit 1.2</b>					

## **Building Reuse:**

Maintain 100% of Existing Walls, Floors and Roof

---

1 Point  
in addition to  
MR 1.1

### **Intent**

Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

### **Requirements**

Maintain an additional 25% (100% total) of existing building structure and shell (exterior skin and framing, excluding window assemblies and non-structural roofing material).

### **Submittals**

- ☐ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, demonstrating the retained elements and declaring that the credit requirements have been met.

### **Potential Technologies & Strategies**

Consider reuse of existing buildings, including structure, shell and non-shell elements. Remove elements that pose contamination risk to building occupants and upgrade outdated components such as windows, mechanical systems and plumbing fixtures. Quantify the extent of building reuse.

SS	WE	EA	MR	EQ	ID
<b>Credit 1.3</b>					

1 Point  
in addition to  
MR 1.1 and 1.2

## **Building Reuse:** Maintain 100% of Shell/Structure and 50% of Non-Shell/Non-Structure

---

### **Intent**

Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

### **Requirements**

Maintain 100% of existing building structure and shell (exterior skin and framing, excluding window assemblies and non-structural roofing material) AND at least 50% of non-shell areas (interior walls, doors, floor coverings and ceiling systems).

### **Submittals**

- ☐ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, demonstrating the retained elements and declaring that the credit requirements have been met.

### **Potential Technologies & Strategies**

Consider reuse of existing buildings, including structure, shell and non-shell elements. Remove elements that pose contamination risk to building occupants and upgrade outdated components such as windows, mechanical systems and plumbing fixtures. Quantify the extent of building reuse.

SS	WE	EA	MR	EQ	ID
Credit 2.1					

## Construction Waste Management: Divert 50% From Landfill

---

1 Point

### Intent

Divert construction, demolition and land clearing debris from landfill disposal. Redirect recyclable recovered resources back to the manufacturing process. Redirect reusable materials to appropriate sites.

### Requirements

Develop and implement a waste management plan, quantifying material diversion goals. Recycle and/or salvage at least 50% of construction, demolition and land clearing waste. Calculations can be done by weight or volume, but must be consistent throughout.

### Submittals

- ☐ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, tabulating the total waste material, quantities diverted and the means by which diverted, and declaring that the credit requirements have been met.

### Potential Technologies & Strategies

Establish goals for landfill diversion and adopt a construction waste management plan to achieve these goals. Consider recycling land clearing debris, cardboard, metal, brick, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation. Designate a specific area on the construction site for recycling and track recycling efforts throughout the construction process. Identify construction haulers and recyclers to handle the designated materials. Note that salvage may include donation of materials to charitable organizations such as Habitat for Humanity.



SS	WE	EA	MR	EQ	ID
Credit 2.2					

1 Point  
in addition to  
MR 2.1

## **Construction Waste Management: Divert 75% From Landfill**

---

### **Intent**

Divert construction, demolition and land clearing debris from landfill disposal. Redirect recyclable recovered resources back to the manufacturing process. Redirect reusable materials to appropriate sites.

### **Requirements**

Develop and implement a waste management plan, quantifying material diversion goals. Recycle and/or salvage an additional 25% (75% total) of construction, demolition and land clearing waste. Calculations can be done by weight or volume, but must be consistent throughout.

### **Submittals**

- ☐ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, tabulating the total waste material, quantities diverted and the means by which diverted, and declaring that the credit requirements have been met.

### **Potential Technologies & Strategies**

Establish goals for landfill diversion and adopt a construction waste management plan to achieve these goals. Consider recycling land clearing debris, cardboard, metal, brick, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation. Designate a specific area on the construction site for recycling and track recycling efforts throughout the construction process. Identify construction haulers and recyclers to handle the designated materials. Note that salvage may include donation of materials to charitable organizations such as Habitat for Humanity.

SS	WE	EA	MR	EQ	ID
Credit 3.1					

## Resource Reuse: 5%

---

1 Point

### Intent

Reuse building materials and products in order to reduce demand for virgin materials and to reduce waste, thereby reducing impacts associated with the extraction and processing of virgin resources.

### Requirements

Use salvaged, refurbished or reused materials, products and furnishings for at least 5% of building materials.

### Submittals

- ☐ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, declaring that the credit requirements have been met and listing each material or product used to meet the credit. Include details demonstrating that the project incorporates the required percentage of reused materials and products and showing their costs and the total cost of materials for the project.

### Potential Technologies & Strategies

Identify opportunities to incorporate salvaged materials into building design and research potential material suppliers. Consider salvaged materials such as beams and posts, flooring, paneling, doors and frames, cabinetry and furniture, brick and decorative items.

SS	WE	EA	<b>MR</b>	EQ	ID
<b>Credit 3.2</b>					

1 Point  
in addition to  
MR 3.1

## **Resource Reuse: 10%**

---

### **Intent**

Reuse building materials and products in order to reduce demand for virgin materials and to reduce waste, thereby reducing impacts associated with the extraction and processing of virgin resources.

### **Requirements**

Use salvaged, refurbished or reused materials, products and furnishings for at least 10% of building materials.

### **Submittals**

- ☐ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, declaring that the credit requirements have been met and listing each material or product used to meet the credit. Include details demonstrating that the project incorporates the required percentage of reused materials and products and showing their costs and the total cost of all materials for the project.

### **Potential Technologies & Strategies**

Identify opportunities to incorporate salvaged materials into building design and research potential material suppliers. Consider salvaged materials such as beams and posts, flooring, paneling, doors and frames, cabinetry and furniture, brick and decorative items.

## **Recycled Content:** 5% (post-consumer + 1/2 post-industrial)

1 Point

### **Intent**

Increase demand for building products that incorporate recycled content materials, therefore reducing impacts resulting from extraction and processing of new virgin materials.

### **Requirements**

Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the post-industrial content constitutes at least 5% of the total value of the materials in the project.

The value of the recycled content portion of a material or furnishing shall be determined by dividing the weight of recycled content in the item by the total weight of all material in the item, then multiplying the resulting percentage by the total value of the item.

Mechanical and electrical components shall not be included in this calculation. Recycled content materials shall be defined in accordance with the Federal Trade Commission document, *Guides for the Use of Environmental Marketing Claims*, 16 CFR 260.7 (e), available at [www.ftc.gov/bcp/grnrule/guides980427.htm](http://www.ftc.gov/bcp/grnrule/guides980427.htm).

### **Potential Technologies & Strategies**

Establish a project goal for recycled content materials and identify material suppliers that can achieve this goal. During construction, ensure that the specified recycled content materials are installed and quantify the total percentage of recycled content materials installed.

### **Submittals**

- ❑ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, declaring that the credit requirements have been met and listing the recycled content products used. Include details demonstrating that the project incorporates the required percentage of recycled content materials and products and showing their cost and percentage(s) of post-consumer and/or post-industrial content, and the total cost of all materials for the project.

SS	WE	EA	MR	EQ	ID
Credit 4.2					

1 Point  
in addition to  
MR 4.1

## **Recycled Content: 10% (post-consumer + 1/2 post-industrial)**

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### **Intent**

Increase demand for building products that incorporate recycled content materials, therefore reducing the impacts resulting from extraction and processing of new virgin materials.

### **Requirements**

Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the post-industrial content constitutes at least 10% of the total value of the materials in the project.

The value of the recycled content portion of a material or furnishing shall be determined by dividing the weight of recycled content in the item by the total weight of all material in the item, then multiplying the resulting percentage by the total value of the item.

Mechanical and electrical components shall not be included in this calculation. Recycled content materials shall be defined in accordance with the Federal Trade Commission document, *Guides for the Use of Environmental Marketing Claims*, 16 CFR 260.7 (e), available at [www.ftc.gov/bcp/grnrule/guides980427.htm](http://www.ftc.gov/bcp/grnrule/guides980427.htm).

### **Submittals**

- ❑ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, declaring that the credit requirements have been met and listing the recycled content products used. Include details demonstrating that the project incorporates the required percentage of recycled content materials and products and showing their cost and percentage(s) of post-consumer and/or post-industrial content, and the total cost of all materials for the project.

### **Potential Technologies & Strategies**

Establish a project goal for recycled content materials and identify material suppliers that can achieve this goal. During construction, ensure that the specified recycled content materials are installed and quantify the total percentage of recycled content materials installed.

## **Regional Materials: 20% manufactured regionally**

---

1 Point

### **Intent**

Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the regional economy and reducing the environmental impacts resulting from transportation .

### **Requirements**

Use a minimum of 20% of building materials and products that are manufactured\* regionally within a radius of 500 miles.

\* Manufacturing refers to the final assembly of components into the building product that is furnished and installed by the tradesmen. For example, if the hardware comes from Dallas, Texas, the lumber from Vancouver, British Columbia, and the joist is assembled in Kent, Washington; then the location of the final assembly is Kent, Washington.

### **Submittals**

- ❑ Provide the LEED Letter Template, signed by the architect or responsible party, declaring that the credit requirements have been met. Include calculations demonstrating that the project incorporates the required percentage of regional materials/products and showing their cost, percentage of regional components, distance from project to manufacturer, and the total cost of all materials for the project.

### **Potential Technologies & Strategies**

Establish a project goal for locally sourced materials and identify materials and material suppliers that can achieve this goal. During construction, ensure that the specified local materials are installed and quantify the total percentage of local materials installed.



SS	WE	EA	MR	EQ	ID
<b>Credit 5.2</b>					

1 Point  
in addition to  
MR 5.1

## **Regional Materials: 50% extracted regionally**

---

### **Intent**

Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the regional economy and reducing the environmental impacts resulting from transportation.

### **Requirements**

Of the regionally manufactured materials documented for MR Credit 5.1, use a minimum of 50% of building materials and products that are extracted, harvested or recovered (as well as manufactured) within 500 miles of the project site.

### **Submittals**

- ☐ Provide the LEED Letter Template, signed by the architect or responsible party, declaring that the credit requirements have been met. Include calculations demonstrating that the project incorporates the required percentage of regional materials/products and showing their cost, percentage of regional components, distance from project to manufacturer, and the total cost of all materials for the project.

### **Potential Technologies & Strategies**

Establish a project goal for locally sourced materials and identify materials and material suppliers that can achieve this goal. During construction, ensure that the specified local materials are installed and quantify the total percentage of local materials installed.

## Rapidly Renewable Materials

---

1 Point

### Intent

Reduce the use and depletion of finite raw materials and long-cycle renewable materials by replacing them with rapidly renewable materials.

### Requirements

Use rapidly renewable building materials and products (made from plants that are typically harvested within a ten-year cycle or shorter) for 5% of the total value of all building materials and products used in the project.

### Submittals

- ❑ Provide the LEED Letter Template, signed by the architect or responsible party, declaring that the credit requirements have been met. Include calculations demonstrating that the project incorporates the required percentage of rapidly renewable products. Show their cost and percentage of rapidly renewable components, and the total cost of all materials for the project.

### Potential Technologies & Strategies

Establish a project goal for rapidly renewable materials and identify materials and suppliers that can achieve this goal. Consider materials such as bamboo flooring, wool carpets, straw board, cotton batt insulation, linoleum flooring, poplar OSB, sunflower seed board, wheatgrass cabinetry and others. During construction, ensure that the specified rapidly renewable materials are installed.

SS	WE	EA	MR	EQ	ID
Credit 7					

1 Point

## Certified Wood

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### Intent

Encourage environmentally responsible forest management.

### Requirements

Use a minimum of 50% of wood-based materials and products, certified in accordance with the Forest Stewardship Council's Principles and Criteria, for wood building components including, but not limited to, structural framing and general dimensional framing, flooring, finishes, furnishings, and non-rented temporary construction applications such as bracing, concrete form work and pedestrian barriers.

### Submittals

- ☐ Provide the LEED Letter Template, signed by the architect, owner or responsible party, declaring that the credit requirements have been met and listing the FSC-certified materials and products used. Include calculations demonstrating that the project incorporates the required percentage of FSC-certified materials/products and their cost together with the total cost of all materials for the project. For each material/product used to meet these requirements, provide the vendor's or manufacturer's Forest Stewardship Council chain-of-custody certificate number.

### Potential Technologies & Strategies

Establish a project goal for FSC-certified wood products and identify suppliers that can achieve this goal. During construction, ensure that the FSC-certified wood products are installed and quantify the total percentage of FSC-certified wood products installed.

# Indoor Environmental Quality

SS	WE	EA	MR	<b>EQ</b>	ID
Prerequisite 1					

## Minimum IAQ Performance

---

Required

### Intent

Establish minimum indoor air quality (IAQ) performance to prevent the development of indoor air quality problems in buildings, thus contributing to the comfort and well-being of the occupants.

### Requirements

Meet the minimum requirements of voluntary consensus standard ASHRAE 62-1999, Ventilation for Acceptable Indoor Air Quality, and approved Addenda (see ASHRAE 62-2001, Appendix H, for a complete compilation of Addenda) using the Ventilation Rate Procedure.

### Submittals

- ☐ Provide the LEED Letter Template, signed by the mechanical engineer or responsible party, declaring that the project is fully compliant with ASHRAE 62-1999 and all published Addenda and describing the procedure employed in the IAQ analysis (Ventilation Rate Procedure).

### Potential Technologies & Strategies

Design the HVAC system to meet the ventilation requirements of the referenced standard. Identify potential IAQ problems on the site and locate air intakes away from contaminant sources.

SS	WE	EA	MR	EQ	ID
<b>Prerequisite 2</b>					

Required

## Environmental Tobacco Smoke (ETS) Control

---

### Intent

Prevent exposure of building occupants and systems to Environmental Tobacco Smoke (ETS).

### Requirements

Zero exposure of non-smokers to ETS by EITHER:

- prohibiting smoking in the building and locating any exterior designated smoking areas away from entries and operable windows;

OR

- providing a designated smoking room designed to effectively contain, capture and remove ETS from the building. At a minimum, the smoking room must be directly exhausted to the outdoors with no recirculation of ETS-containing air to the non-smoking area of the building, enclosed with impermeable deck-to-deck partitions and operated at a negative pressure compared with the surrounding spaces of at least 7 PA (0.03 inches of water gauge).
- Performance of the smoking rooms shall be verified by using tracer gas testing methods as described in the ASHRAE Standard 129-1997. Acceptable exposure in non-smoking areas is defined as less than 1% of the tracer gas concentration in the smoking room detectable in the adjoining non-smoking areas. Smoking room testing as described in ASHRAE Standard 129-1997 is required in the contract documents and critical smoking facility systems testing results must be included in the building commissioning plan and report or as a separate document.

### Submittals

- ☐ Provide the LEED Letter Template, signed by the building owner or responsible party, declaring that the building will be operated under a policy prohibiting smoking.

OR

- ☐ Provide the LEED Letter Template, signed by the mechanical engineer or responsible party, declaring and demonstrating that designated smoking rooms are exhausted to the outdoors with no recirculation of ETS-containing air to the non-smoking area of the building, enclosed with impermeable deck-to-deck partitions, operated at a negative pressure compared with the surrounding spaces of at least 7 PA (0.03 inches of water gauge), and performance has been verified using the method described in the credit requirements.

SS	WE	EA	MR	<b>EQ</b>	ID
<b>Prerequisite 2</b>					

## **Environmental Tobacco Smoke (ETS) Control**

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Required

(continued)

### **Potential Technologies & Strategies**

Prohibit smoking in the building or provide separate smoking rooms with isolated ventilation systems.

SS	WE	EA	MR	<b>EQ</b>	ID
<b>Credit 1</b>					

1 Point

## **Carbon Dioxide (CO<sub>2</sub>) Monitoring**

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### **Intent**

Provide capacity for indoor air quality (IAQ) monitoring to help sustain long-term occupant comfort and well-being.

### **Requirements**

Install a permanent carbon dioxide (CO<sub>2</sub>) monitoring system that provides feedback on space ventilation performance in a form that affords operational adjustments. Refer to the CO<sub>2</sub> differential for all types of occupancy in accordance with ASHRAE 62-2001, Appendix D.

### **Submittals**

- ☐ Provide the LEED Letter Template, signed by the mechanical engineer or responsible party, declaring and summarizing the installation, operational design and controls/zones for the carbon dioxide monitoring system. For mixed-use buildings, calculate CO<sub>2</sub> levels for each separate activity level and use.

### **Potential Technologies & Strategies**

Design the HVAC system with carbon dioxide monitoring sensors and integrate these sensors with the building automation system (BAS).



## Ventilation Effectiveness

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1 Point

### Intent

Provide for the effective delivery and mixing of fresh air to support the safety, comfort and well-being of building occupants.

### Requirements

For mechanically ventilated buildings, design ventilation systems that result in an air change effectiveness (Eac) greater than or equal to 0.9 as determined by ASHRAE 129-1997. For naturally ventilated spaces demonstrate a distribution and laminar flow pattern that involves not less than 90% of the room or zone area in the direction of air flow for at least 95% of hours of occupancy.

### Submittals

- ☐ For mechanically ventilated spaces: provide the LEED Letter Template, signed by the mechanical engineer or responsible party, declaring that the design achieves an air change effectiveness (Eac) of 0.9 or greater in each ventilated zone. Complete the table summarizing the air change effectiveness achieved for each zone.

OR

- ☐ For mechanically ventilated spaces: provide the LEED Letter Template, signed by the mechanical engineer or responsible party, declaring that the design complies with the recommended design approaches in ASHRAE 2001 Fundamentals Chapter 32, Space Air Diffusion.

OR

- ☐ For naturally ventilated spaces: provide the LEED Letter Template, signed by the mechanical engineer or responsible party, declaring that the design provides effective ventilation in at least 90% of each room or zone area in the direction of airflow for at least 95% of hours of occupancy. Include a table summarizing the airflow simulation results for each zone. Include sketches indicating the airflow pattern for each zone.

### Potential Technologies & Strategies

Design the HVAC system and building envelope to optimize air change effectiveness. Air change effectiveness can be optimized using a variety of ventilation strategies including displacement ventilation, low-velocity ventilation, plug-flow ventilation such as under floor or near floor delivery, and operable windows. Test the air change effectiveness of the building after construction.

SS	WE	EA	MR	EQ	ID
Credit 3.1					

1 Point

## Construction IAQ Management Plan: During Construction

### Intent

Prevent indoor air quality problems resulting from the construction/renovation process in order to help sustain the comfort and well-being of construction workers and building occupants.

### Requirements

Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:

- During construction meet or exceed the recommended Design Approaches of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, 1995, Chapter 3.
- Protect stored on-site or installed absorptive materials from moisture damage.
- If air handlers must be used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 must be used at each return air grill, as determined by ASHRAE 52.2-1999.
- Replace all filtration media immediately prior to occupancy. Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13, as determined by ASHRAE 52.2-1999 for media installed at the end of construction.

### Submittals

- ☐ Provide the LEED Letter Template, signed by the general contractor or responsible party, declaring that a Construction IAQ Management Plan has been developed and implemented, and listing each air filter used during construction and at the end of construction. Include the MERV value, manufacturer name and model number.

AND EITHER

- ☐ Provide 18 photographs—six photographs taken on three different occasions during construction—along with identification of the SMACNA approach featured by each photograph, in order to show consistent adherence to the credit requirements

OR

- ☐ Declare the five Design Approaches of SMACNA IAQ Guideline for Occupied Buildings under Construction, 1995, Chapter 3, which were used during building construction. Include a brief description of some of the important design approaches employed.

SS	WE	EA	MR	EQ	ID
<b>Credit 3.1</b>					

## **Construction IAQ Management Plan: During Construction**

1 Point

(continued)

### **Potential Technologies & Strategies**

Adopt an IAQ management plan to protect the HVAC system during construction, control pollutant sources and interrupt contamination pathways. Sequence the installation of materials to avoid contamination of absorptive materials such as insulation, carpeting, ceiling tile and gypsum wall board.

SS	WE	EA	MR	EQ	ID
Credit 3.2					

1 Point

## Construction IAQ Management Plan: Before Occupancy

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### Intent

Prevent indoor air quality problems resulting from the construction/renovation process in order to help sustain the comfort and well-being of construction workers and building occupants.

### Requirements

Develop and implement an Indoor Air Quality (IAQ) Management Plan for the pre-occupancy phase as follows:

- After construction ends and prior to occupancy conduct a minimum two-week building flush-out with new Minimum Efficiency Reporting Value (MERV) 13 filtration media at 100% outside air. After the flush-out, replace the filtration media with new MERV 13 filtration media, except the filters solely processing outside air.

OR

- Conduct a baseline indoor air quality testing procedure consistent with the United States Environmental Protection Agency's current *Protocol for Environmental Requirements, Baseline IAQ and Materials, for the Research Triangle Park Campus, Section 01445*.

### Submittals

- ☐ Provide the LEED Letter Template, signed by the architect, general contractor or responsible party, describing the building flush-out procedures and dates.

OR

- ☐ Provide the LEED Letter Template, signed by the architect or responsible party, declaring that the referenced standard's IAQ testing protocol has been followed. Include a copy of the testing results.

### Potential Technologies & Strategies

Prior to occupancy, perform a two week building flush-out or test the contaminant levels in the building.

SS	WE	EA	MR	EQ	ID
Credit 4.1					

## Low-Emitting Materials: Adhesives & Sealants

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1 Point

### Intent

Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well-being of installers and occupants.

### Requirements

The VOC content of adhesives and sealants used must be less than the current VOC content limits of South Coast Air Quality Management District (SCAQMD) Rule #1168, AND all sealants used as fillers must meet or exceed the requirements of the Bay Area Air Quality Management District Regulation 8, Rule 51.

### Submittals

- ☐ Provide the LEED Letter Template, signed by the architect or responsible party, listing the adhesives and sealants used in the building and declaring that they meet the noted requirements.

### Potential Technologies & Strategies

Specify Low-VOC materials in construction documents. Ensure that VOC limits are clearly stated in each section where adhesives and sealants are addressed.

SS	WE	EA	MR	EQ	ID
<b>Credit 4.2</b>					

1 Point

## **Low-Emitting Materials: Paints and Coatings**

---

### **Intent**

Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well-being of installers and occupants.

### **Requirements**

VOC emissions from paints and coatings must not exceed the VOC and chemical component limits of Green Seal's Standard GS-11 requirements.

### **Submittals**

- ☐ Provide the LEED Letter Template, signed by the architect or responsible party, listing all the interior paints and coatings used in the building that are addressed by Green Seal Standard GS-11 and stating that they comply with the current VOC and chemical component limits of the standard.

### **Potential Technologies & Strategies**

Specify Low-VOC paints and coatings in construction documents. Ensure that VOC limits are clearly stated in each section where paints are addressed.

## Low-Emitting Materials: Carpet

---

1 Point

### Intent

Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well-being of installers and occupants.

### Requirements

Carpet systems must meet or exceed the requirements of the Carpet and Rug Institute's Green Label Indoor Air Quality Test Program.

### Submittals

- ❑ Provide the LEED Letter Template, signed by the architect or responsible party, listing all the carpet systems used in the building and stating that they comply with the current VOC limits of the Carpet and Rug Institute's Green Label Indoor Air Quality Test Program.

### Potential Technologies & Strategies

Specify Low-VOC carpet products and systems in construction documents. Ensure that VOC limits are clearly stated where carpet systems are addressed.

SS	WE	EA	MR	EQ	ID
<b>Credit 4.4</b>					

1 Point

## **Low-Emitting Materials: Composite Wood**

---

### **Intent**

Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well-being of installers and occupants.

### **Requirements**

Composite wood and agrifiber products must contain no added urea-formaldehyde resins.

### **Submittals**

- ☐ Provide the LEED Letter Template, signed by the architect or responsible party, listing all the composite wood products used in the building and stating that they contain no added urea-formaldehyde resins.

### **Potential Technologies & Strategies**

Specify wood and agrifiber products that contain no added urea-formaldehyde resins.



## Indoor Chemical & Pollutant Source Control

1 Point

### Intent

Avoid exposure of building occupants to potentially hazardous chemicals that adversely impact air quality.

### Requirements

Design to minimize pollutant cross-contamination of regularly occupied areas:

- Employ permanent entryway systems (grills, grates, etc.) to capture dirt, particulates, etc. from entering the building at all high volume entryways.
- Where chemical use occurs (including housekeeping areas and copying/printing rooms), provide segregated areas with deck to deck partitions with separate outside exhaust at a rate of at least 0.50 cubic feet per minute per square foot, no air re-circulation and maintaining a negative pressure of at least 7 PA (0.03 inches of water gauge).
- Provide drains plumbed for appropriate disposal of liquid waste in spaces where water and chemical concentrate mixing occurs.

### Submittals

- ❑ Provide the LEED Letter Template, signed by the architect or responsible party, declaring that:
  - Permanent entryway systems (grilles, grates, etc.) to capture dirt, particulates, etc. are provided at all high volume entryways.
  - Chemical use areas and copy rooms have been physically separated with deck-to-deck partitions; independent exhaust ventilation has been installed at 0.50 cfm/square foot and that a negative pressure differential of 7 PA has been achieved.
  - In spaces where water and chemical concentrate mixing occurs, drains are plumbed for environmentally appropriate disposal of liquid waste.

### Potential Technologies & Strategies

Design separate exhaust and plumbing systems for rooms with contaminants to achieve physical isolation from the rest of the building. Install permanent architectural entryway systems such as grills or grates to prevent occupant-borne contaminants from entering the building.

SS	WE	EA	MR	EQ	ID
<b>Credit 6.1</b>					

1 Point

## **Controllability of Systems: Perimeter Spaces**

---

### **Intent**

Provide a high level of thermal, ventilation and lighting system control by individual occupants or specific groups in multi-occupant spaces (i.e. classrooms or conference areas) to promote the productivity, comfort and well-being of building occupants.

### **Requirements**

Provide at least an average of one operable window and one lighting control zone per 200 square feet for all regularly occupied areas within 15 feet of the perimeter wall.

### **Submittals**

- ☐ Provide the LEED Letter Template, signed by the architect or responsible party, demonstrating and declaring that for regularly occupied perimeter areas of the building a minimum of one operable window and one lighting control zone are provided per 200 square feet on average.

### **Potential Technologies & Strategies**

Design the building with occupant controls for airflow, temperature and lighting. Strategies to consider include lighting controls, task lighting and operable windows.

## **Controllability of Systems: Non-Perimeter Spaces**

---

1 Point

### **Intent**

Provide a high level of thermal, ventilation and lighting system control by individual occupants or specific groups in multi-occupant spaces (i.e. classrooms or conference areas) to promote the productivity, comfort and well-being of building occupants.

### **Requirements**

Provide controls for each individual for airflow, temperature and lighting for at least 50% of the occupants in non-perimeter, regularly occupied areas.

### **Submittals**

- ☐ Provide the LEED Letter Template, signed by the architect or responsible party, demonstrating and declaring that controls for individual airflow, temperature and lighting are provided for at least 50% of the occupants in non-perimeter, regularly occupied areas.

### **Potential Technologies & Strategies**

Design the building with occupant controls for airflow, temperature and lighting. Strategies to consider include task lighting and underfloor HVAC systems with individual diffusers.

SS	WE	EA	MR	EQ	ID
Credit 7.1					

1 Point

## **Thermal Comfort:** Compliance with ASHRAE 55-1992

---

### **Intent**

Provide a thermally comfortable environment that supports the productivity and well-being of building occupants.

### **Requirements**

Comply with ASHRAE Standard 55-1992, Addenda 1995, for thermal comfort standards including humidity control within established ranges per climate zone. For naturally ventilated buildings, utilize the adaptive comfort temperature boundaries, using the 90% acceptability limits as defined in the California High Performance Schools (CHPS) Best Practices Manual, Appendix C – A Field Based Thermal Comfort Standard for Naturally Ventilated Buildings, Figure 2.

### **Submittals**

- ☐ For mechanically ventilated spaces: provide the LEED Letter Template, signed by the engineer or responsible party, declaring that the project complies with ASHRAE Standard 55-1992, Addenda 1995. Include a table that identifies each thermally controlled zone, and that summarizes for each zone the temperature and humidity control ranges and the method of control used.

OR

- ☐ For naturally ventilated spaces: provide the LEED Letter Template, signed by the engineer or responsible party declaring that the project complies with the 90% acceptability limits of the adaptive comfort temperature boundaries in the California High Performance Schools (CHPS) Best Practices Manual Appendix C – A Field Based Thermal Comfort Standard for Naturally Ventilated Buildings, Figure 2.

### **Potential Technologies & Strategies**

Establish temperature and humidity comfort ranges and design the building envelope and HVAC system to maintain these comfort ranges.

SS	WE	EA	MR	EQ	ID
<b>Credit 7.2</b>					

## **Thermal Comfort: Permanent Monitoring System**

---

1 Point  
in addition to  
EQ 7.1

### **Intent**

Provide a thermally comfortable environment that supports the productivity and well-being of building occupants.

### **Requirements**

Install a permanent temperature and humidity monitoring system configured to provide operators control over thermal comfort performance and the effectiveness of humidification and/or dehumidification systems in the building.

### **Submittals**

- ❑ Provide the LEED Letter Template, signed by the engineer or responsible party, declaring that a permanent temperature and humidity monitoring system will operate throughout all seasons to permit control of the building zones within the seasonal thermal comfort ranges defined in ASHRAE 55-1992, Addenda 1995. Confirm that the temperature and humidity controls were (or will be) tested as part of the scope of work for Energy and Atmosphere Prerequisite 1, Fundamental Building Systems Commissioning. Include the document name and section number where the commissioning work is listed.

### **Potential Technologies & Strategies**

Establish temperature and humidity comfort ranges and design the building envelope and HVAC system to maintain these comfort ranges. Install and maintain a temperature and humidity monitoring system in the building to automatically adjust building conditions as appropriate.

SS	WE	EA	MR	EQ	ID
<b>Credit 8.1</b>					

1 Point

## **Daylight and Views: Daylight 75% of Spaces**

---

### **Intent**

Provide for the building occupants a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

### **Requirements**

Achieve a minimum Daylight Factor of 2% (excluding all direct sunlight penetration) in 75% of all space occupied for critical visual tasks. Spaces excluded from this requirement include copy rooms, storage areas, mechanical plant rooms, laundry and other low occupancy support areas. Other exceptions for spaces where tasks would be hindered by the use of daylight will be considered on their merits.

### **Submittals**

- ☐ Provide the LEED Letter Template signed by the architect or responsible party. Provide area calculations that define the daylight zone and provide prediction calculations or daylight simulation.

### **Potential Technologies & Strategies**

Design the building to maximize interior daylighting. Strategies to consider include building orientation, shallow floor plates, increased building perimeter, exterior and interior permanent shading devices, high performance glazing and photo-integrated light sensors. Predict daylighting via calculations or model daylighting strategies with a physical or computer model to assess footcandle levels and daylight factors achieved.

## Daylight and Views: Views for 90% of Spaces

---

1 Point

### Intent

Provide for the building occupants a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

### Requirements

Achieve direct line of sight to vision glazing for building occupants in 90% of all regularly occupied spaces. Examples of exceptions include copy rooms, storage areas, mechanical, laundry and other low occupancy support areas. Other exceptions will be considered on their merits.

### Submittals

- ☐ Provide the LEED Letter Template and calculations describing, demonstrating and declaring that the building occupants in 90% of regularly occupied spaces will have direct lines of sight to perimeter glazing. Provide drawings highlighting the direct line of sight zones.

### Potential Technologies & Strategies

Design the building to maximize view opportunities.

SS	WE	EA	MR	EQ	ID
Credit 1					

# Innovation & Design Process

1-4 Points

## Innovation in Design

---

### Intent

To provide design teams and projects the opportunity to be awarded points for exceptional performance above the requirements set by the LEED Green Building Rating System and/or innovative performance in Green Building categories not specifically addressed by the LEED Green Building Rating System.

### Requirements

- Credit 1.1 (1 point) In writing, identify the **intent** of the proposed innovation credit, the proposed **requirement** for compliance, the proposed **submittals** to demonstrate compliance, and the **design approach** (strategies) that might be used to meet the requirements.
- Credit 1.2 (1 point) Same as Credit 1.1
- Credit 1.3 (1 point) Same as Credit 1.1
- Credit 1.4 (1 point) Same as Credit 1.1

### Submittals

- ☐ Provide the proposal(s) within the LEED Letter Template (including intent, requirement, submittals and possible strategies) and relevant evidence of performance achieved.

### Potential Technologies & Strategies

Substantially exceed a LEED performance credit such as energy performance or water efficiency. Apply strategies or measures that are not covered by LEED such as acoustic performance, education of occupants, community development or lifecycle analysis of material choices.



SS	WE	EA	MR	EQ	ID
<b>Credit 2.1</b>					

## LEED Accredited Professional

---

1 Point

### Intent

To support and encourage the design integration required by a LEED Green Building project and to streamline the application and certification process.

### Requirement

At least one principal participant of the project team that has successfully completed the LEED Accredited Professional exam

### Submittals

- ☐ Provide the LEED Letter Template stating the LEED Accredited Professional's name, title, company and contact information. Include a copy of this person's LEED Accredited Professional Certificate.

### Potential Technologies & Strategies

Attending a LEED Accredited Professional Training Workshop is recommended but not required. Study the LEED Reference Guide. Successfully pass the LEED accreditation exam.



## Great Seneca Creek Elementary School

## Little Bennett Elementary School

### **"Green and Sustainable" Benefits**

### **"Green and Sustainable" Benefits**

Geothermal mechanical system with individual heat pumps allows users individual comfort controls.
Bike storage w/ shower/changing rooms
Preferred carpool spaces
Waterless Urinals
Dual-Flush Toilets in Kindergarten Classrooms - pilot program
Low-Flow Aerators and Shower Heads
Sensored Faucets in Multi-Fount Lavatories at group toilets
Green Power
Energy Efficient Windows w/ Low-E Insulated Glass (NW7- Fiberglass Windows - pilot program)
Commissioning During Design, Construction, and Occupancy
Storage and Collection of Recyclables
Electric Hand Dryers in Boys' and Girls' Toilet Rooms - pilot program
100% Construction Waste Management
Low-Emitting Materials (Adhesives and Sealants, Paints, Carpets, Etc.)
Wheatboard Casework in Classrooms and Instructional Media Center
High Percentage of Recycled Materials (Recycled Toilet Partitions in Northwest ES 7)
Maximum Natural Daylight in Classrooms (Large Windows, Sloped Ceilings, Light Colors)
HCFC-Free Cooling

Geothermal mechanical system with individual heat pumps allows users individual comfort controls.
Bike storage
Waterless Urinals
Low-Flow Aerators and Shower Heads
Sensored Faucets in Multi-Fount Lavatories at group toilets
Green Power
Energy Efficient Windows w/ Low-E Insulated Glass
Commissioning During Construction, and Occupancy
Storage and Collection of Recyclables
80% Construction Waste Management
Low-Emitting Materials (Adhesives and Sealants, Paints, Carpets, Etc.)
Wheatboard Casework in Classrooms and Instructional Media Center
High Percentage of Recycled Materials
Maximum Natural Daylight in Classrooms (Large Windows, Sloped Ceilings, Light Colors)
HCFC-Free Cooling

### **Sustainable Sites**

### **Sustainable Sites**

Compact Footprint/ Overlapping Fields - Using less site minimize environmental impact
Light Pollution Reduction - Site lighting does not spill over to neighboring properties
Shade and High-Albedo - Plant shade trees and use High Albedo Materials
Energy Star Roof - High Albedo coating on the flat roof reduces the heat island effect.
Geothermal - Ground source well fields under adjacent ballfields
Native Plantings - no irrigation

Compact Footprint/ Overlapping Fields - Using less site minimize environmental impact
Light Pollution Reduction - Site lighting does not spill over to neighboring properties
Shade and High-Albedo - Plant shade trees and use High Albedo Materials
Energy Star Roof - High Albedo coating on the flat roof reduces the heat island effect.
Geothermal - Ground source well fields under adjacent ballfields
Native Plantings - no irrigation

### **Green Education**

### **Green Education**

Inspire and educate students about the environment with mural and floor patterns
Display boards/signs and monitors

Inspire and educate students about the environment with mural
Display boards

<b>Water Use Reduction</b>
----------------------------

<b>Water Use Reduction</b>
----------------------------

Waterless Urinals
Dual/Single Flush Toilets - pilot program
Multi-font Lavatories
Low-Flow Aerators and Shower Heads

Waterless Urinals
Multi-font Lavatories
Low-Flow Aerators and Shower Heads

<b>Materials</b>
------------------

<b>Materials</b>
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Reduce VOC content
Monitor raw material extraction
Use of renewable products
Use of recycled products
Minimal transportation to site

Reduce VOC content
Use of renewable products
Use of recycled products
Minimal transportation to site

<b>Indoor Environmental Quality</b>
-------------------------------------

<b>Indoor Environmental Quality</b>
-------------------------------------

Construction IAQ Plan- Pilot
Day Lighting and views - natural daylighting increases learning
Individual controls in spaces
Operable windows

Day Lighting and views - natural daylighting increases learning
Individual controls in spaces
Operable windows

# Great Seneca Creek Elementary School – Green Book

## 3. Resources

- Brochure
- Floor Plan with Legend
- Fortune Teller Game ( 1<sup>st</sup> & 2<sup>nd</sup> grade)
- Be a Green Detective Maze (1<sup>st</sup> & 2<sup>nd</sup> grade)
- Fortune teller Game (3<sup>rd</sup>-6<sup>th</sup> grade)
- Scavenger Hunt (3<sup>rd</sup>-6<sup>th</sup> grade)

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## MISSION

The Green Building Program of Montgomery County Public Schools provides leadership in energy and environmental design. The program advocates environmental stewardship and resource conservation through intelligent design, technology pilots, high performance design training and innovative strategies.

## 1ST LEED PILOT SCHOOL

The new 84,000 sf elementary school in Germantown is registered for a certification as the first public LEED School in Maryland.

LEED stands for Leadership in Energy and Environmental Design and is a rating system from the US Green Building Council. The system provides a checklist for the design process in the categories of Sustainable Sites, Water Efficiency, Energy and Atmosphere, Material and Resources, Indoor Environmental Quality and Design Innovation. The more points the project is able to achieve in the six categories, the higher the ranking and third party certificate from the Council- from a basic LEED certification to Silver, Gold and Platinum.

A design charrette conducted in 2003 with members from the MCPS Department of Facilities Management and green building experts determined the energy and environmental design goals for this MCPS pilot project.

## MCPS Green Building Program

Department of Facilities Management, Suite 203  
2096 Gaither Road, Suite 200, Rockville, MD 20850  
Phone 240-314-1095, Fax 240-314-1037

[www.schools2green.org](http://www.schools2green.org)

Anja S. Caldwell, Green Building Program Manager  
[Anja\\_S\\_Caldwell@mcpsmd.org](mailto:Anja_S_Caldwell@mcpsmd.org)

### School Contact:

Principal Gregory Edmundson  
13010 Dairymaid Drive, Germantown, MD 20874  
Phone 301-353-8500  
[www.greatsenecacreekes.org](http://www.greatsenecacreekes.org)

### MORE GREEN SCHOOLS RESOURCES:

**SERT - School Eco Response Team** (Students)  
MCPS Resource Conservation Program  
[Sert@mcpsmd.org](mailto:Sert@mcpsmd.org)

**LEED** - Leadership in Energy and Environmental Design  
US Green Building Council – [www.usgbc.org](http://www.usgbc.org)

**Sustainable Buildings Industry Council**  
[www.sbicouncil.org](http://www.sbicouncil.org)

**Maryland Green Schools Award Program**  
[www.maeoe.org](http://www.maeoe.org)

**Schoolyard Habitat**  
US Fish and Wildlife Service - [www.fws.gov](http://www.fws.gov)

**Collaborative for High Performance Schools**  
[www.chps.net](http://www.chps.net)

## Great Seneca Creek Elementary School

...because good planets  
are hard to find.



[WWW.GREATSENECACREEKES.ORG](http://WWW.GREATSENECACREEKES.ORG)

## GREEN TECHNOLOGY AT GREAT SENECA CREEK ES

### SITE



Land use and planning a sustainable building site is fundamental for future generations.

- Erosion control during construction
- Reduced site disturbance
- Development and building footprint
- No mow grass and meadows
- Native and non invasive vegetation
- Wetland restoration/protection
- Light pollution reduction on site and in the building
- Schoolyard Habitat project \*
- Rain gardens \*

### WATER



Native vegetation and low-flow and efficient plumbing fixtures reduce fresh water need by 43%.

- Waterless urinals
- Dual-flush toilets
- Low-flow faucets and showerheads
- No irrigation and native vegetation

### ENERGY



Energy efficient design with natural lighting and ground source heat pumps reduce energy costs and our impact on the environment.

- Geothermal energy system
- Large windows for natural light & winter heating
- Light-colored reflective roofs reduce cooling load
- Energy-Star compliant

- 100% Green Power procurement
- Energy Management System (EMS)
- Efficient building envelope
- User Education Program - SERT
- Lighting standardization

### MATERIALS



Taking advantage of recycling opportunities will save money and help conserve natural resources.

- Recycling program
- Wheat board casework
- Recycled materials for toilet partitions
- 90% Construction waste recycled
- Use of local materials within 500 miles
- Use of Forest Stewardship Council Certified Wood

### INDOOR ENVIRONMENT + HEALTH



By carefully choosing materials and fostering good ventilation we provide a healthy and safe environment for the occupants of the building.

- Materials, paints and finishes that emit fewer toxic fumes (low VOC)
- Promoting healthy indoor air quality through effective ventilation
- Practices that discourage mold, dust and mites
- Green Housekeeping Initiative
- No fumes from idling buses
- Elimination of CFCs, HCFC's and halons
- Large windows for outdoor views
- Integrated Pest Management
- Tools for Schools IAQ
- Formaldehyde free materials

\* Future Community Projects



The building has low-flow fixtures that achieve 43% savings in potable water, including no-flush urinals and dual flush options for toilets in the Kindergarten classrooms that has been color coded by the kids. The school has a geoexchange system with all the piping buried under the athletic field. The constant ground temperature of 58°F provides heat in the winter and cooling in the summer. This “free” energy is expected to save about \$0.50 per square foot a year in energy cost and maintenance.

The buildings roof is a white Energy Star roof, which helps reduce the Heat Island Effect- the heating of the atmosphere through dark surfaces. This will reduce the air conditioning load as most of MCPS buildings are now operating throughout the year. The utility savings in this school are expected to be more than \$ 50,000 a year. During construction more than 90% of the waste has been recycled and extra care given to protect the site and soil. The duct work was protected and sealed from dust and debris during construction at all times.

An information kiosk is located in the lobby and a website holds all the green information. A keyed building tour and scavenger hunt explains the green and LEED related features of the building to students, staff and community members. Signs are posted in all the classrooms, by the windows, restrooms and at mechanical rooms as an educational tool for students, teachers and parents. Signs outdoors explain no-mow areas, wetland, native vegetation and geothermal field. The signs can be customized by the student's environmental club, as this building will function like a 3D textbook with active student involvement in MCPS' environmental programs. User education and behavior modification can make a difference of more than 15% for the utility bills of a school.





### 1 Site.....

- ✓ **Schoolyard Habitat Project**
- ✓ **No mow grass and meadow**
- ✓ **Wetland restoration**
- ✓ **Reforestation**



### 2 Water.....

- ✓ **Waterless urinals**
- ✓ **Dual-flush toilets**
- ✓ **Low-flow faucets and showerhead**
- ✓ **Native vegetation no irrigation**

1

**Wetland  
&  
No Mow**

3

**Geothermal**

3

**Geothermal**

3

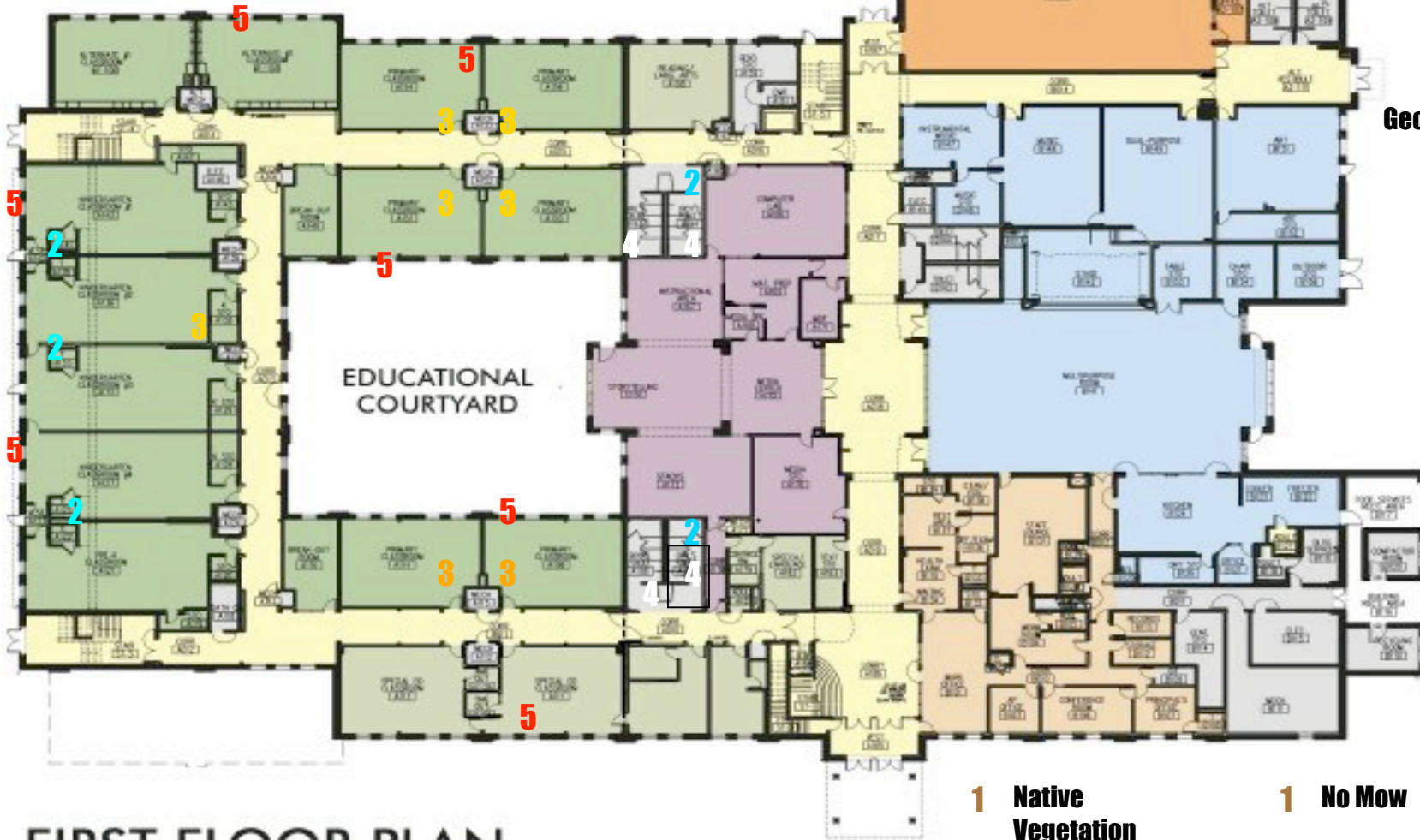
**Geothermal  
Field**

1

**No Mow**

1

**No Mow**



## FIRST FLOOR PLAN

FRONT ENTRY

1

**Native  
Vegetation**

1

**No Mow**



### 3 Energy...

- ✓ **Geothermal energy system**
- ✓ **Efficient building envelope**
- ✓ **Large windows for natural light & winter heating**



### 4 Materials

- Taking advantage of recycling opportunities saves money, reduces waste and saves natural resources
- ✓ **Recycling program**
  - ✓ **Recycled materials for toilet partition**
  - ✓ **Wheatboard casework**
  - ✓ **Forest Stewardship council certified wood**



### 5 Indoor Environments

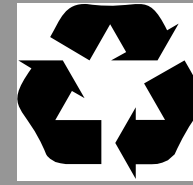
- ✓ **Green Housekeeping initiatives**
- ✓ **Effective ventilation**
- ✓ **Low emit materials**
- ✓ **Large windows**



How do I  
Save energy?

- Turn off lights when not needed
- Use natural light from wide windows
- Geothermal energy
- White roof-reflects heat
- Green Procurement
- User education program (SERT)
- Your ideas

How does  
GSCES  
Save  
energy?



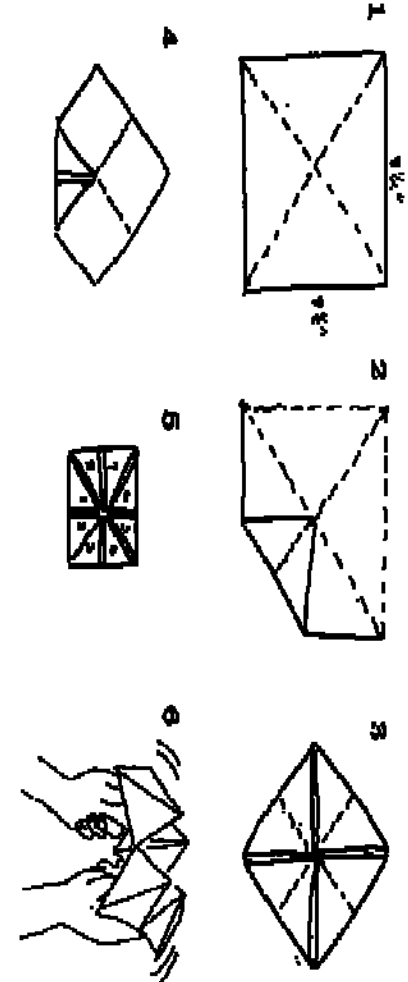
**Do you have a  
green future?**

**Let the fortune  
teller tell you**

How does  
GSCES save  
water?

- Low flow faucets
- Native vegetation
- Dual flush toilet
- Waterless urinals
- Your ideas

How do I  
save  
water at  
home?



What do I  
recycle?

What  
does  
GSCCE  
Recycle?

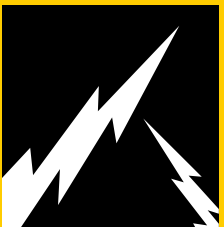
- Recycles paper
  - Recycles can and bottles
  - Your ideas
- Recycled materials used at GSCES
- Recycled plastic- Bathroom partitions
  - Wheat straw- Wheat board cupboards

- No mow zones
- Wetland protection
- Native and non invasive vegetation
- Your ideas



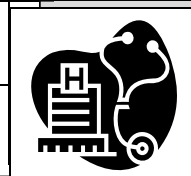
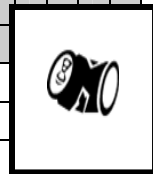
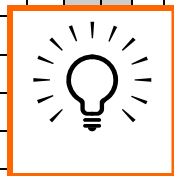
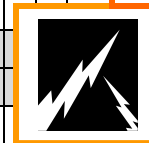
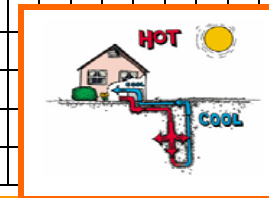
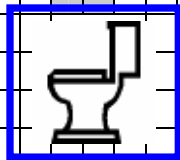
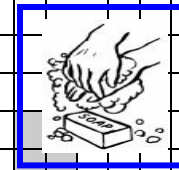
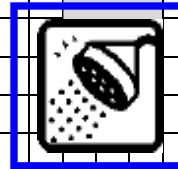
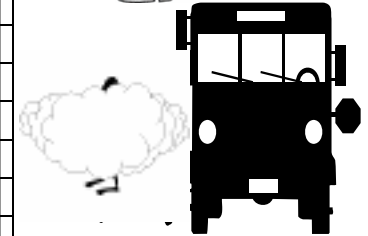
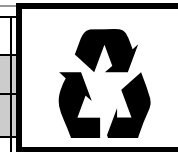
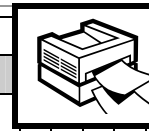
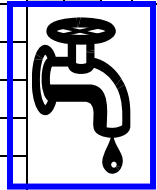
How is  
GSCES a  
good land  
Steward?

How am I a  
good land  
steward?



**Start  
Here**

**You can  
save lots  
of water!**



**Great!!  
you 've  
Recycled  
and saved  
lots of  
energy and  
water !!!**

**You're SAVING  
ENERGY Here**

**Ok, detectives this is  
serious stuff. Here is the**

**skinny on today's case.**

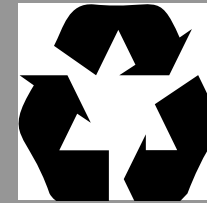
**Detective GreenBottom wants you  
to help her make Great Seneca  
Creek Elementary School  
greener.**

**Can you be a super green sleuth  
And help Greenbottom find  
recyclables and save water and  
energy ?**



**How do I  
save energy?**

**How  
does  
GSCES  
Save  
energy?**



**Do you have a  
green future?**

**Let the fortune  
teller tell you**

**How is  
GSCES  
a good  
land  
steward?**

- No mow zones
- Wetland protection
- Native and non invasive vegetation

**How am I  
a good land  
steward?**

- Turn off lights when not needed
- Use natural light from windows
- Geothermal energy
- White roof-reflects heat
- Green power procurement

**How does  
GSCES save  
water?**

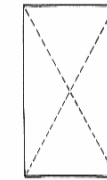
- Low flow faucets and showers
- Native vegetation
- Dual flush toilet
- Waterless urinals

**How do I  
save  
water at  
home?**

- Recycles paper
- Recycles can and bottles
- Recycled plastic- Bathroom partitions
- Wheat straw- Wheat board

**How  
does  
GSCES  
recycle?**

**How do I  
recycle?**



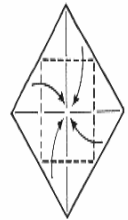
1. Fold color side down on both diagonals. Unfold



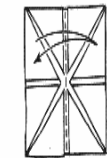
2. Fold all four corners to center



3. Turn paper over



4. Again, fold all corners to center



5. Fold paper in half and unfold



6. Fold in half from top to bottom. Do not unfold.



7. Slide thumbs and forefingers under the squares and move the Fortune Teller back and forth to play.







How does GSCES promote a healthy indoor environment?

- Good ventilation, open windows
- Green housekeeping cleaning products
- Paints and materials that don't release bad fumes

How can I make my environment healthier?



What does GSCES recycle?

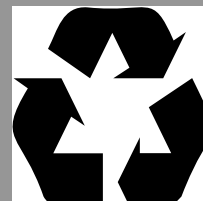
- Recycles paper
  - Recycles can and bottles
  - Your ideas
- Recycled products used at GSCES
- Recycled plastic- Bathroom partitions
  - Wheat straw- Wheat board

How can I be a good land steward?

- No mow zones
- Wetland protection
- Native and non invasive vegetation

What do I recycle?

- Low flow faucets
- Native vegetation
- Dual flush toilet
- Waterless urinals



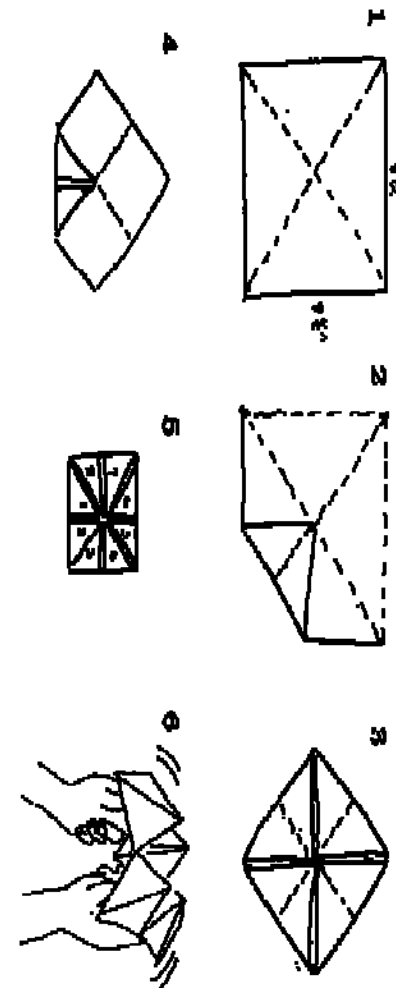
How does GSCES save water?

How do I save water at home?



Do you have a green future?

Let the fortune teller tell you





How does GSCES promote a healthy indoor environment?

- Good ventilation, open windows
- Green housekeeping cleaning products
- Paints and materials that don't release bad fumes

How can I make my environment healthier?



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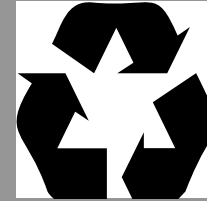
- Recycles paper
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- Recycled products used at GSCES
- Recycled plastic- Bathroom partitions
  - Wheat straw- Wheat board

What do I recycle?

How can I be a good land steward?

- No mow zones
- Wetland protection
- Native and non invasive vegetation

- Low flow faucets
- Native vegetation
- Dual flush toilet
- Waterless urinals



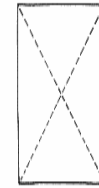
How does GSCES save water?

How do I save water at home?



Do you have a green future?

Let the fortune teller tell you



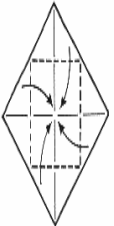
1. Fold color side down on both diagonals. Unfold



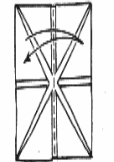
2. Fold all four corners to center



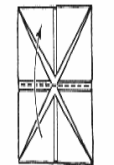
3. Turn paper over



4. Again, fold all corners to center



5. Fold paper in half and unfold



6. Fold in half from top to bottom. Do not unfold.



# Great Seneca Creek's Green Features Scavenger Hunt

Great Seneca Creek ES has many green features. Your goal is to find the green features around your school. Using the hints, the signage and teachers and staff unscramble each of the clue words. Copy the letters in the numbered cells to other cells with the same number and you'll discover the Green Building motto. Good Luck!

## HINTS

Conserves 1.5 to 3 gallons\*

Heat and cool with energy from the Earth\*

Building materials that contribute to good air quality

Promotes wildlife habitat & reduces air pollution

Lets daylight in but not infrared

Key to indoor air quality

An area that drains to a common waterway.

Reflective coating, reflects the sun's heat

A green mode of transportation

A program designed to reduce the environmental impact of electricity.

You have 2 options when you need less water

You might just find old plastic containers

Trees cut from forests managed to environmental and social standards.

Green Building motto

SASRELETW LAIRUSN

19									5 4 18								

EMTAHLEORG ESSYSTM

22									6								

WLO MITE REALIMAST

7																	

ON WOM NOEZ

10					30				

WOIDWN GIZAGLN

25						8		23					

IINENOATVLT

13									

TDREAHESW

14					16				

WETIH ROFO

					24 9 28				

KIGBIN

29		15			

GERNE POWRE RUCENTEMRPO

20						12					3		21								

DULA HSFUL TOISELT

31										26 27		2						

LYECDREC DOBAR TOTRIPINA

										1							

FICERDIET DOOW

17									11					

1	2	3	4	5	6	7	

8	9	10	11	

12	13	14	15	16	17	18			

19	20	21

22	23	24	25	

26	27

28	29	30	31

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# Great Seneca Creek Elementary School – Green Book

## 4. Signage

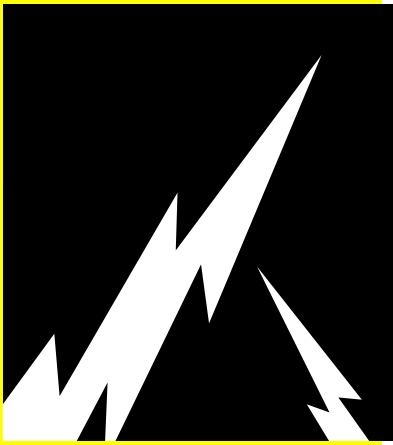
- Signage Indoors
- Signage Outdoors
- Kiosk PowerPoint Green Building Features @ Great Seneca Creek and LEED

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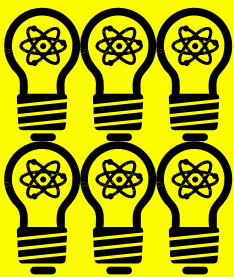


## SECOND FLOOR PLAN



## **POWER TO SAVE!**

Did you know that the average American consumes 6 times more energy than the world average?



# **CONSERVE ENERGY!**

**Generating Electricity causes pollution and global warming.**

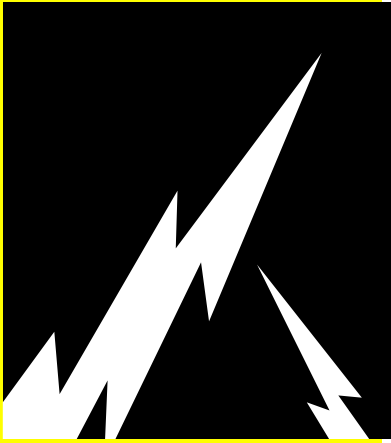
**Less than 30% of the electricity made by burning coal in Dickerson for our school is actually being used at GSC, the rest is lost in the transport.**

**Here is how you can help to protect the environment and prevent global warming in this classroom:**

- **Close the blinds at night.**
- **Turn off all the lights when you leave.**
- **Use daylight and only as many electrical lights as you need.**
- **Turn off computers and printers.**

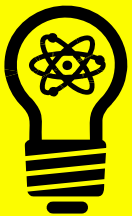


*[www.Schools2Green.org](http://www.Schools2Green.org)*



**POWER TO  
SAVE!**

**Did you know?  
That oil comes from  
plants and animals that  
lived before the age of  
the dinosaurs!**



# **CONSERVE ENERGY!**

**Thanks for saving energy  
I think we're all aware  
If we just do our share  
We'll set a pace, to help erase  
Pollution from the air  
We thank you,  
Yes we all thank-you  
for saving energy !**



**Thanks for the memories**

Courtesy of <http://www.wattsnew.com/wattsnew3/songs/jukeframes.html>

*[www.Schools2Green.org](http://www.Schools2Green.org)*



# GEO THERMAL ENERGY

**Geo = earth      Thermal = heat**

- **Geothermal heat pump uses the constant energy from the earth to provide heating and cooling.**

## Winter

- **A water glycol solution circulates through the pipes buried in the ground, absorbs heat from the earth and carries it into the school!**
- **The heat pump concentrates the earth's thermal energy and transfers it to hot air circulated around the school.**

## Summer

- **Heat is extracted from the air in the school (making the air cooler!) and transferred through the heat pump to the ground.**

**Did you know that the energy from the earth below your feet can keep you warm during the winter and cool during the summer ?**



Drilling of the 120 wells



Mechanical Room  
between Classrooms

[www.Schools2Green.org](http://www.Schools2Green.org)

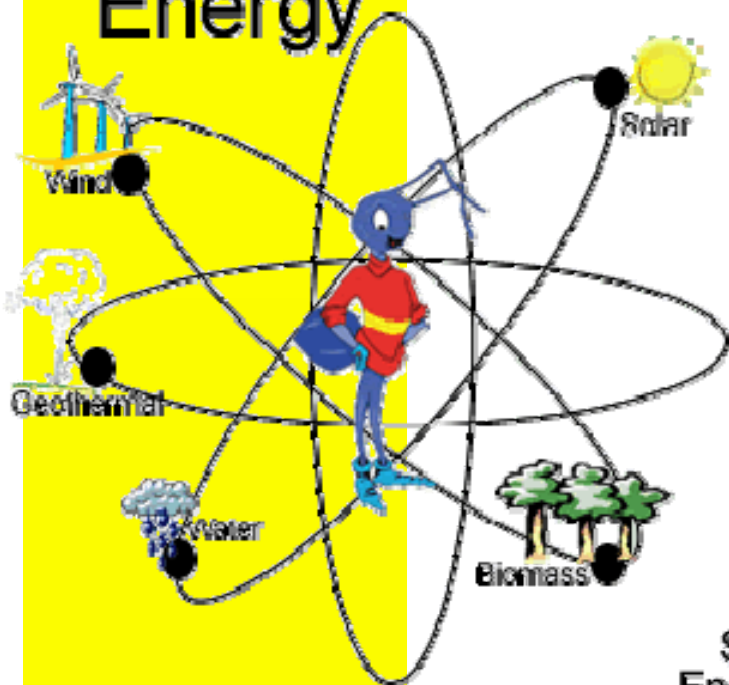


# **RENEWABLE ENERGY USE**

## **@ Great Seneca Creek ES**

- ✓ **GEOTHERMAL ENERGY**
- ✓ **WIND ENERGY AND SOLAR ENERGY THROUGH GREEN PROCUREMENT (100% Green Power)**

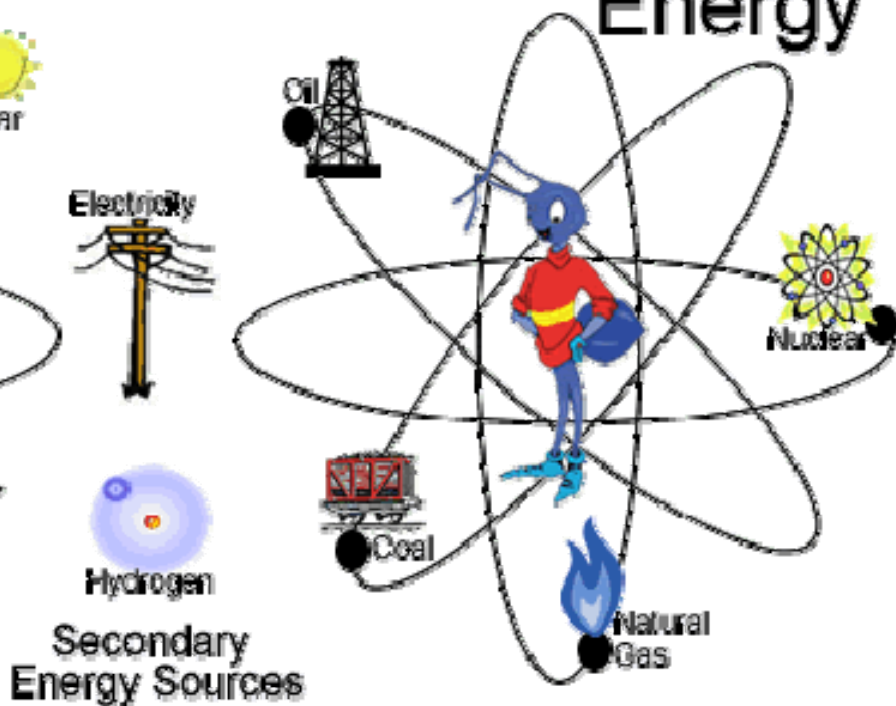
### **Renewable Energy**



**SAVE  
ENERGY!**



### **Non-Renewable Energy**



**OIL and COAL ARE EXAMPLES OF  
NON- RENEWABLE ENERGY RESOURCES.**

*[www.Schools2Green.org](http://www.Schools2Green.org)*



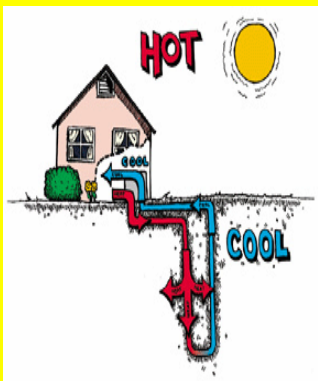


# GEO THERMAL ENERGY

**Geo = earth**

**Thermal = heat**

**Geothermal heat pump uses the constant energy from the earth to provide heating and cooling.**



- **Geothermal energy is always available!**
- **Geothermal energy is reliable.**
- **Geothermal energy is local.**
- **Geothermal energy is endless!**
- **Geothermal energy is less expensive.**
- **Geothermal energy does not emit CO2.**

**Did you know that the energy from the earth below your feet can warm and cool you ?**

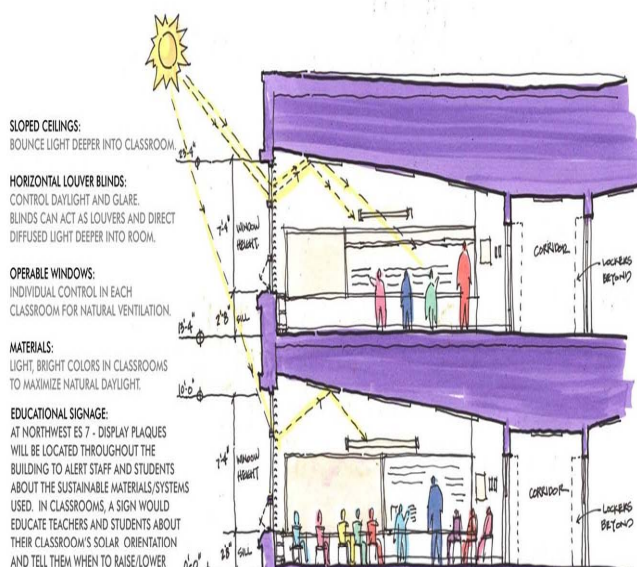
**Geothermal energy can heat you up and cool you down!**



*[www.Schools2Green.org](http://www.Schools2Green.org)*

# Indoor Environment

- **Open the blinds and turn off the lights during the day – lots of daylight and views to the outside help students learn better**
- **Close blinds at night for energy conservation.**
- **Sloped ceiling allows for larger windows, so more light can get in.**



**Did you know?**  
**That studies show**  
**that the Indoor**  
**environment can**  
**affect your school**  
**performance?**

*www.Schools2Green.org*



Did you know  
that some commercial  
cleaning products can  
contain chemicals that  
can trigger an asthma  
episode ?



# Indoor Environment

## GREEN HOUSEKEEPING

**...to create a cleaner, healthier, safer and more productive indoor environment for students and staff.**

### Products

- **Products used minimize exposure to hazardous substances.**
- **Cleaning products minimize impact on the environment.**

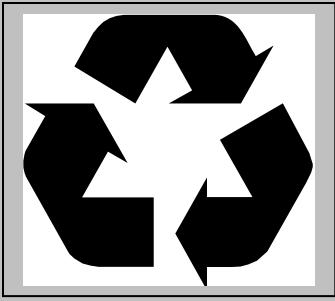
### Procedures

- **Cleaning procedures are geared towards “cleaning for health” extracting a maximum amount of pollutants.**

### Training

- **Effective, efficient cleaning methods.**
- **Safe use of cleaning products.**

*www.Schools2Green.org*



**Reduce,  
Reuse,  
Recycle,  
Respect**

**Did you know?  
4% of the world's annual  
oil production is used for  
plastic production and 3%  
is used during  
manufacture**



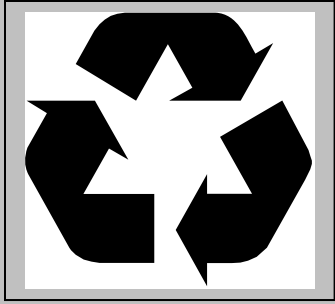
# Recycled Materials

- **Plastic is made from oil**
- **1.8 ton of oil is saved for every ton of plastic recycled.**
- **There are over 100 different varieties of plastics.**
- **Bathroom partitions at GSC are made of 100% recycled plastic.**



*[www.Schools2Green.org](http://www.Schools2Green.org)*





**Did you know?**

**Casework made of wheat straw and resin is stronger and heavier than wood?**

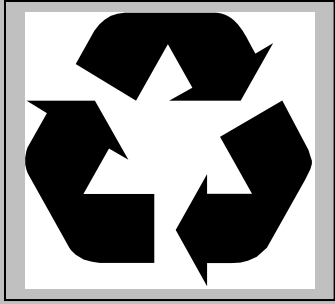


# **Sustainable Materials**

- **The casework at GSC is made from wheat straw and a polyurethane resin – wheat board**
- **Wheatboard is a rapidly renewable agricultural byproduct**
- **Wheatboard reduces waste, prevents pollution and saves trees.**



*[www.Schools2Green.org](http://www.Schools2Green.org)*



**Did you know?**

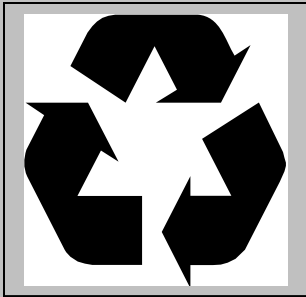
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# **Sustainable Materials**

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*[www.Schools2Green.org](http://www.Schools2Green.org)*



**Reduce,  
Reuse and  
Recycle  
paper!**

**Did you know?  
It takes 10 times as  
much energy to  
produce a new piece  
of paper than it does  
to make a copy on the  
second side.**

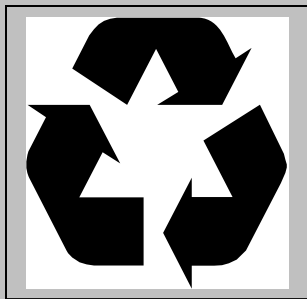


# Why Recycle Paper ?

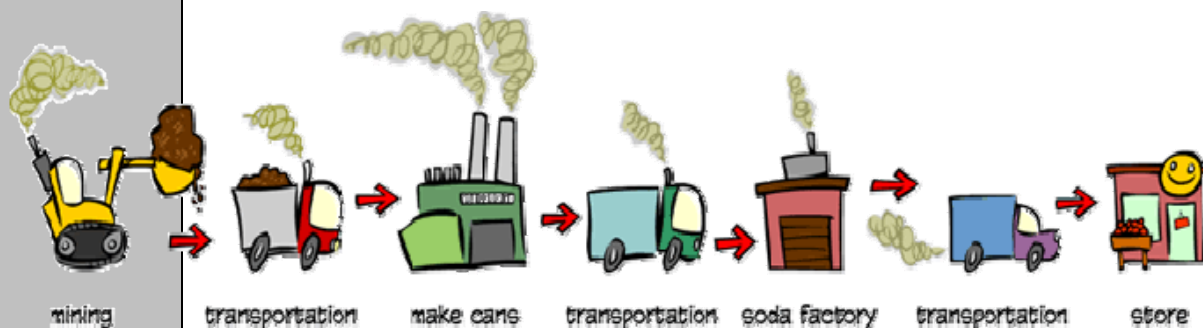
- **Recycling paper means that less paper goes to landfill sites.**
- **Making paper from recycled paper uses less energy than producing it from virgin materials like trees.**
- **Less polluting chemicals are used to produce recycled paper than new paper.**
- **Recycling saves trees, water and energy!**



[www.Schools2Green.org](http://www.Schools2Green.org)



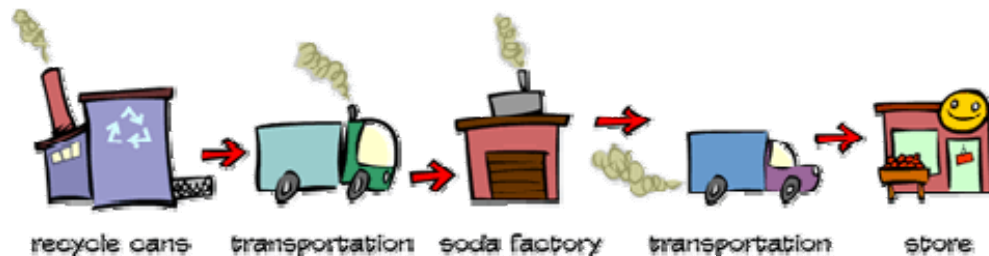
# Reduce - Reuse - Recycle!



## Did you know?

The energy saved from recycling one aluminum can will run your TV for 3 hrs.

It will take 500 years for a soda can to break down.



[www.Schools2Green.org](http://www.Schools2Green.org)





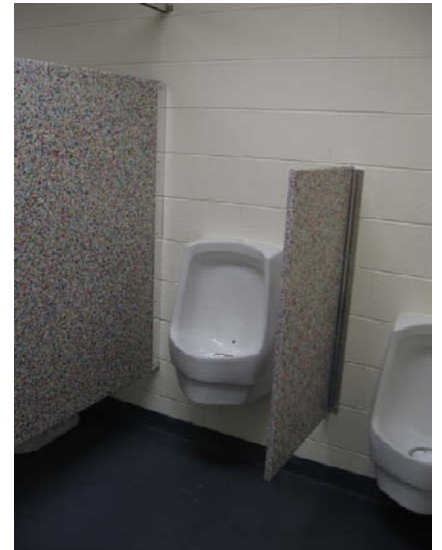
**Conserve  
Water!**

**Did you know?  
20 % of the only 1%  
drinking water on our  
planet is flushed  
down the drain.  
Great Seneca Creek ES  
uses 43% less water  
than other elementary  
schools.**



# **WATERLESS URINALS**

- **No need to flush and no floods**
- **Odorless**
- **Better restroom hygiene**
- **Conserves 1.5 gallons per use**



*[www.Schools2Green.org](http://www.Schools2Green.org)*



# SAVE WATER!

**Dual Flush Toilets**  
**1.6 or 0.8 gallons**



**If it is  
brown  
push  
here!**

**If it is  
yellow  
push  
here!**



*[www.Schools2Green.org](http://www.Schools2Green.org)*



# **WATER CONSERVATION**

- **When washing your hands, don't let the water run while you lather.**

**Did you know that?**

- **97 % of all water in the world is salty.**
- **2% is locked up in ice caps and glaciers.**
- **That leaves 1% for all our needs.**



*[www.Schools2Green.org](http://www.Schools2Green.org)*

**WHERE DOES THE **RAIN** THAT FALLS ON  
GREAT SENECA CREEK ES GO?**



**Rains that falls on Great Seneca Creek ES...**

**Drains into Great Seneca Creek**



**Great Seneca Creek drains into the Potomac River**



**Potomac River drains into the Chesapeake Bay**



**Chesapeake Bay drains into the Atlantic Ocean**



**Great Seneca Creek ES is part of the  
**Chesapeake Watershed!****

***www.Schools2Green.org***







**Did you know that?**

You can save water while brushing your teeth by filling up a glass of water to rinse your teeth instead of letting the water run.



## **WHERE DOES THE DRINKING WATER AT GREAT SENECA CREEK ES COME FROM?**

- **2/3 of the households in Maryland depend on surface water sources (reservoirs and river intakes such as the Patuxent River or Gunpowder Falls) treated and delivered by public or private water companies.**
- **1/3 of households depend on groundwater sources provided by either public or private companies (17%) or individual wells (16%).**
- **Where does Great Seneca Creek Elementary School get its drinking water from?\***



*[www.Schools2Green.org](http://www.Schools2Green.org)*

\* The Potomac River

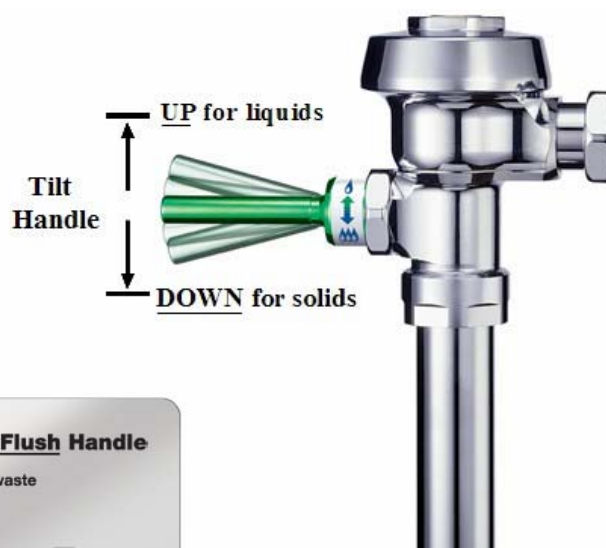


# SAVE WATER!

## Dual Flush Toilets

**1.6 gallons – Press Down**  
**0.8 gallons – Pull up**

**Handle has antimicrobial coating**

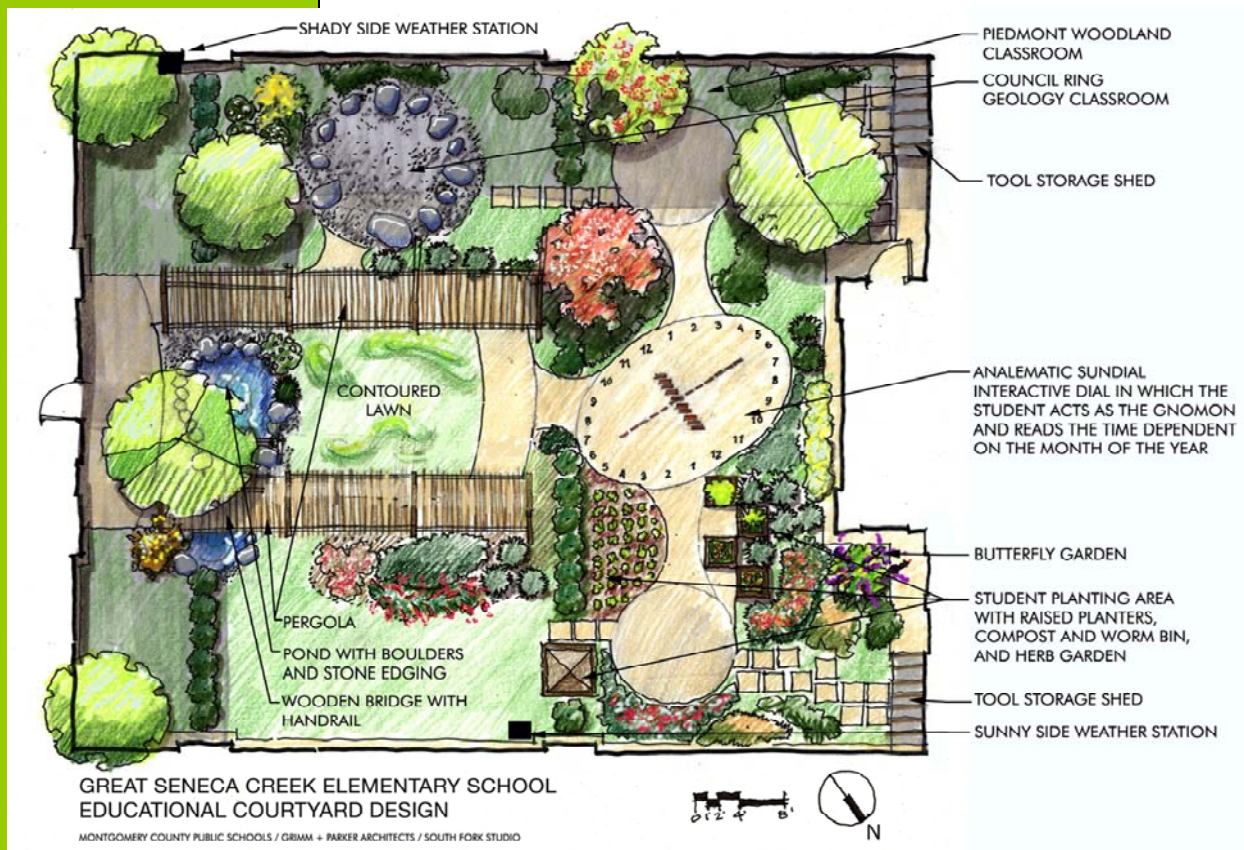


[www.Schools2Green.org](http://www.Schools2Green.org)



# Educational Courtyard

- Rain and Butterfly Gardens
- Student Planting Area and Sundial
- Native Plants

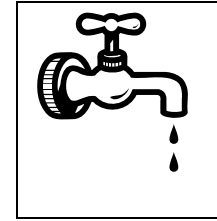


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# SUSTAINABLE SITE & LAND USE

## Saving Water with Plants



### What are Native Plants/ Native Vegetation?

Native plants are those plants that were growing naturally in the area before human introduced plants from distant places. Native plants often have historical and cultural interest and can provide a link to the past. Some plants played a role in Native American culture or in European exploration and settlement. Some native plants may have value as food or medicine. Others may have been used as cordage, textiles or dyestuffs.

### Native Plants are good for the environment and people and they save time and money.

- Native plants are vigorous and hardy because they are adapted to local conditions
- Native plants are “low maintenance.”
- Native plants are resistant to most local pests and disease and don’t need pesticides, fertilizers or watering.
- Native plants rarely become invasive they are kept in check by a natural balance.
- Native plants enhance biodiversity by providing food and shelter for a host of local birds, butterflies and beneficial insects.
- Native plants have extensive root systems which increases their ability to retain soil and store water.
- Native landscaping is a commitment to environmental stewardship

### What is meant by Non-Invasive?

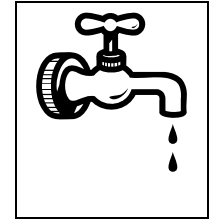
Each native plant species is a member of a community that includes other plants, animals and microorganisms. The natural balance keeps each species in check, allowing it to thrive in conditions where it is suited, but preventing it from running amok. Thus, native species rarely become invasive like plants introduced from distant places.

**“Wherever I go in America, I like it when the land speak its own language in its own regional accent”**

**Mrs. Lyndon Johnson Wildflowers Across America 1993**

# **SUSTAINABLE SITE & LAND USE**

## **WATER SAVING - No Mow Zone**



**No Mow zones are**

- a wild lawn composed of fine fescues (grasses) that regenerate naturally.
- seeded with slow growing drought resistant grasses.
- have seeds that grow in full sun or moderate shade and in regular to very dry soil.
- self perpetuating sustainable and interdependent community of plant and animal life.
- used to replace mowed areas.
- keep natural habitats connected.

**No Mow Zones are better for people and the environment because they :**

- Promote wildlife habitat and environmental stewardship.
  - Promote the return of native species.
  - Improve air and water quality through reduced spent fuel emissions.
  - Conserve the environment, no fertilizers and pesticides infiltration or run-off.
  - Reduce the demand for non-renewable resources fuel usage and costs.
  - Save staff hours spent mowing.
- Extend life of lawn mowing equipment.

# SUSTAINABLE SITE & LAND USE



## Wetland Restoration and Protection

### What are wetlands?

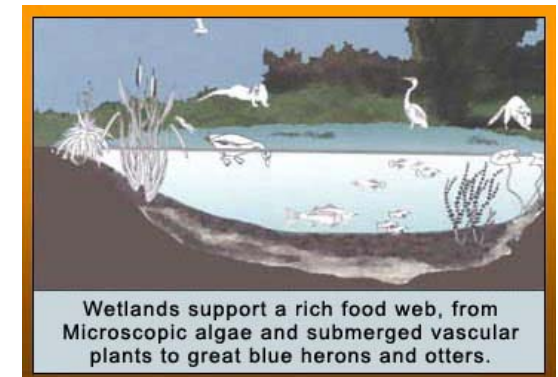
- Wetlands are areas such as swamps, marches, bogs and fens where the land is either permanently or periodically wet.
- Wetlands provide habitats for plants and animals adapted to such conditions.
- Wetlands are an important transition zone in watersheds- they are a vital link between land and water.
- Wetlands play an integral role in the ecology of the Chesapeake watershed.

“Wetlands are lands where the saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface.”

(Cowardin, December 1979)

### Wetlands are important because they:

- Filter and enhance water quality and reduce and regulate flood water
- Protect against erosion
- Create opportunities for recreation, education and research
- Are spawning, nursery, nesting and feeding grounds for fish and other wildlife
- Are habitats for plants, insects, amphibians, reptiles, fish, birds and mammals
- Are places where people can connect with nature



Wetlands support a rich food web, from Microscopic algae and submerged vascular plants to great blue herons and otters.

### You can help protect wetland by

- Thinking about wetlands in your community and telling your friends and family how important wetlands are.
- Staying on paths and making as little impact as possible when visiting wetlands
- Celebrating May as wetland month. The EPA inaugurated May as wetland month in 1991 as a way to educate American about the value of wetlands as a natural resource.

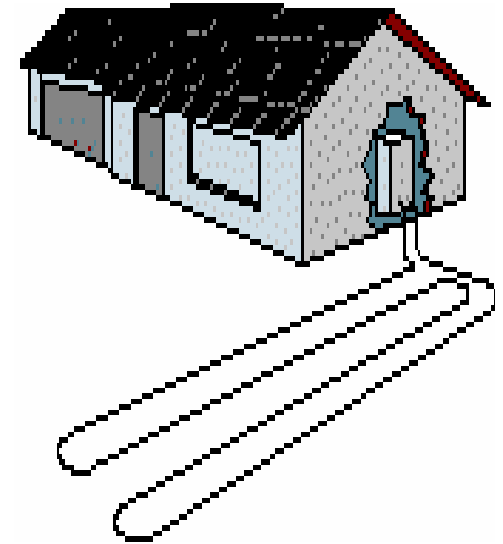
# GEOEXCHANGE

Geothermal energy uses the natural heat storage capacity of the earth to provide energy efficient heating and cooling.

## Can you see the geothermal field?

Although you cannot see the geothermal field under the ball field there is approximately 24.6 miles or 40 kilometers of pipe laid out beneath the surface of the Earth below the frost line. We drilled 120 wells, each 515 feet deep.

The pipes in our geothermal field are connected to geothermal exchange heat pump inside the school's mechanical room, interconnected in ten circuits with each circuit having a supply and return line.



## Winter

During the winter, a 13,000 gallon solution made up of 80% water and 20% glycol is circulating through the pipes buried in the ground absorbing heat from the Earth and carrying it back into the school.

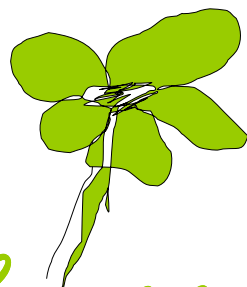
The exchanger inside the school uses a heat pump to concentrate the earth's thermal energy and to transfer it to air circulated through standard ductwork to warm the school.

## Summer

During the summer the process is reversed. Heat is extracted from the air in the school and transferred through the heat pump to the ground piping. The water-glycol solution in the ground carries the excess heat back into the earth. The only external energy needed is to operate the pump.

# Great Seneca Creek ES

- First LEED School in Maryland



*www.Schools2Green.org*



[www.greatsenecacreekes.org](http://www.greatsenecacreekes.org)

*www.Schools2Green.org*

## Sustainability at MCPS

- Tools for Schools – IAQ
- Outdoor Education
- MCPS Recycling
- Healthy High Performance Cleaning
- Energy Resources Team
  - Green Schools Focus



MCPS - Montgomery County Public Schools  
ROCKVILLE, MARYLAND

## Why LEED™ for GSC ES?

- Roadmap to meet excellence goals
- Lower maintenance and operation costs
- Third party performance verification
- Design to exceed code compliance
- Healthy and comfortable buildings
- Environmental stewardship

Green Building MCPS



## LEED™

- Four levels of certification (69 points)
  - Certified 26 - 32 points
  - Silver Level **33** - 38 points
  - Gold Level 39 - 51 points
  - Platinum Level 52+ points

[www.Schools2Green.org](http://www.Schools2Green.org)

## Leadership in Energy and Environmental Design



- Sustainable Sites
- Water Efficiency
- Energy Efficiency & Atmosphere
- Materials & Resources
- Indoor Environmental Quality
- Innovation & Design process

The LEED rating system, comprised of four certification levels, Certified, Silver, Gold and Platinum, corresponds to the number of credits achieved by a building in the six categories.

## Scorecard



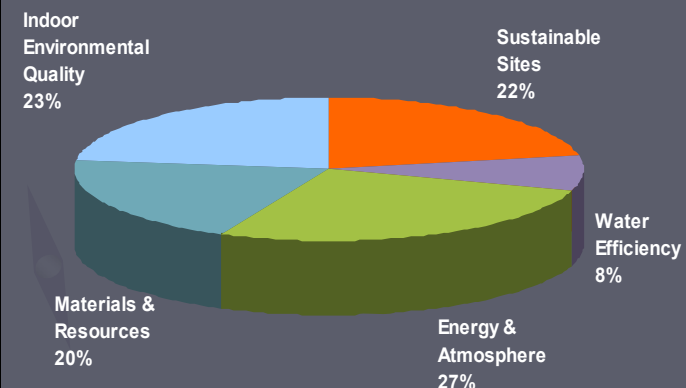
Total Project Score		Possible Points: 69
Certified Green Building Points		Possible Points: 69
Sustainable Sites		Possible Points: 14
1	1	1
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4	1	1
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Sustainable Design Consulting



## Categories

Leadership in Energy and Environmental Design



Department of Facilities Management

MCPS



## LEED Certified Schools in the Area

- ▶ Third Creek ES in Raleigh, NC  
– LEED Gold
- ▶ Clearview ES in Hanover, PA  
– LEED Gold
- ▶ Langston Brown HS in Arlington, VA  
– LEED Silver
- ▶ Sidwell Friends MS, Washington DC  
– LEED Platinum

MCPS Department of Facilities Management

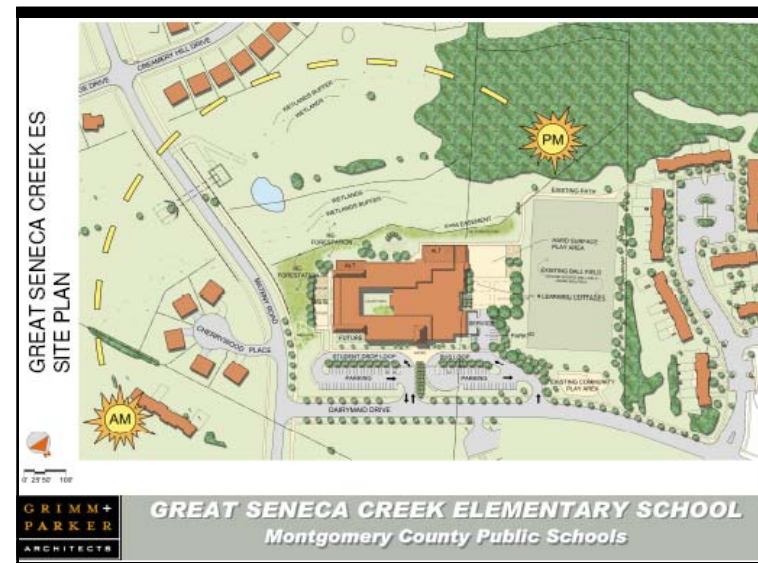
## LEED Design Charrette 2003



A design charrette was conducted in 2003 with individuals from the MCPS Department of Facilities Management and national green building experts to develop the energy and environmental design goals for Great Seneca Creek ES.



MCPS Montgomery County Public Schools  
ROCKVILLE, MARYLAND



## SUSTAINABLE SITES

- **COMPACT FOOTPRINT/OVERLAPPING FIELDS:** By making the school a compact, two-story structure with double loaded corridors, we were able to avoid long wings and keep the building footprint closer to a tight square. The ball fields overlap one another to minimize environmental impact.
- **WETLANDS:** At Northwest ES 7, school site does not encroach on neighboring stream valley or wetlands on the property.
- **LIGHT POLLUTION REDUCTION**

### CLARKSBURG/DAMASCUS ES #7



### NORTHWEST ES #7

- **SHADE and HIGH-ALBEDO:** Provide shade on play and parking paving from site trees and use high-albedo materials (such as concrete paving).
- **ENERGY STAR ROOF:** Energy Star-rated coating over built-up roofing to reduce heat island effect on the building's flat roofs.
- **GEOTHERMAL:** Both schools will utilize adjacent ball-fields for ground-source well fields (efficient mechanical system).
- **REFORESTATION/MEADOWS:** at Northwest ES 7.
- **NATIVE PLANTINGS:** Require no site watering.

## NORTHWEST ES #7 + CLARKSBURG/DAMASCUS ES #7 "GREEN"/"SUSTAINABLE" BENEFITS INCLUDE:

- BIKE STORAGE W/ SHOWER/CHANGING ROOMS
- WATERLESS URINALS
- DUAL-FLUSH TOILETS IN KINDERGARTEN CLASSROOMS
- LOW-FLOW AERATORS AND SHOWER HEADS
- SENSOR FAUCETS IN MULTI-FOUNT LAVATORIES
- FIBERGLASS WINDOWS W/ LOW-E, INSULATED GLASS
- COMMISSIONING DURING DESIGN, CONSTRUCTION, AND OCCUPANCY
- STORAGE AND COLLECTION OF RECYCLABLES (RECYCLING ROOM AT LOADING DOCK FOR SORTING)



FIRST FLOOR PLAN

FRONT ENTRY

## NORTHWEST ES #7 + CLARKSBURG/DAMASCUS ES #7 FRONT ENTRY ELEVATION

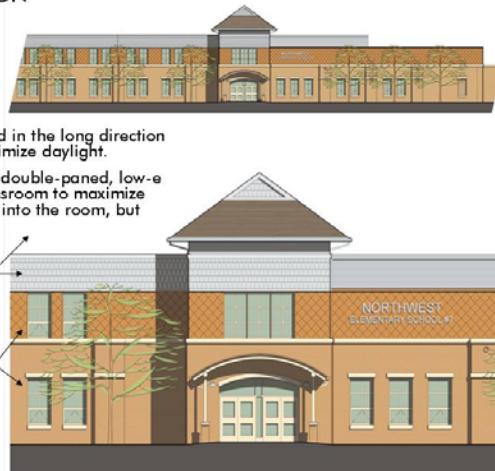
### Windows:

Typical classrooms are oriented in the long direction along the window wall to maximize daylight.

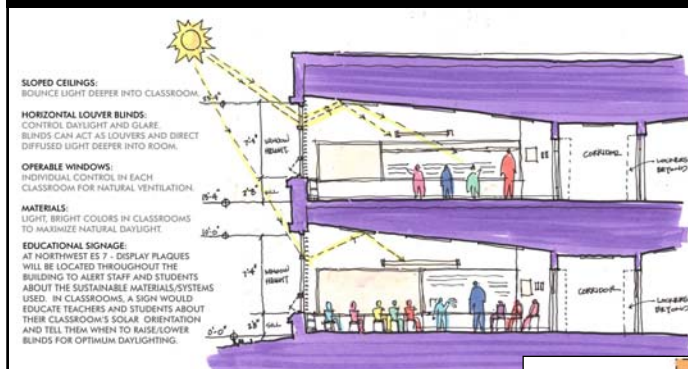
Large fiberglass windows with double-paned, low-e insulating glazing in every classroom to maximize natural daylight transmittance into the room, but control radiant heat transfer.

### Materials:

- Metal shingles
- Locally-available brick



## TYPICAL CLASSROOM SECTION STUDY –



TALL WINDOWS IN EVERY CLASSROOM TO MAXIMIZE NATURAL DAYLIGHT





# LEED Category 1: Sustainable Sites



## Sustainable Sites

### Construction Activity Pollution Prevention

LEED Intent: Reduce pollution from construction activities by controlling soil erosion, waterway sedimentation and airborne dust generation.

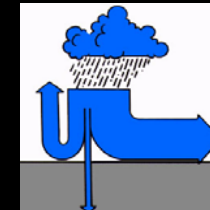


## Rainwater Infiltration

### Forest and Open Space    Urban Areas

40% - Evapotranspiration  
30% - Shallow Infiltration  
30% - Deep Infiltration  
0% - Runoff

15% - Evapotranspiration  
5% - Shallow Infiltration  
5% - Deep Infiltration  
75% - Runoff






## Rainwater Infiltration



Shrubs and Trees  
Cisterns and  
Ponds  
Less Paving  
Raingardens  
Ground Covers  
Retaining Walls  
No-Mow Zones  
Vegetated Roofs








**Rain that falls on  
Great Seneca Creek Elementary...**

- Drains into Great Seneca Creek
- Great Seneca Creek drains into the Potomac River
- Potomac River drains into the Chesapeake Bay
- Chesapeake Bay drains into the Atlantic Ocean

**Great Seneca Creek ES is part of the Chesapeake Watershed!**

Great Seneca Creek
Potomac River
Chesapeake Bay
Atlantic



[www.Schools2Green.org](http://www.Schools2Green.org)

**Vegetated "Green" Roof Pilot**

at Northwood High School

- Extensive Green Roof Pilot
- Installed August 2005
- First on public school in MD







Montgomery County Public Schools  
ROCKVILLE, MARYLAND

Green  Building

MCPS

## Sustainable Sites

### Stormwater Quality Control

LEED Intent:  
Limit disruption & pollution of  
natural water flows by  
managing stormwater runoff



## Sustainable Sites

### Heat Island Effect, Roof

LEED Intent: reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize Impact on microclimate and human and wildlife habitat.



Energy Star White Roof

## Sustainable Sites



Prevent "Light Pollution" by  
keeping light on site and down

## LEED Category 2: Water Efficiency





# Water Efficiency

## Water Use Reduction 20% & 30%

LEED Intent: Maximize water efficiency within building reduce the burden on the municipal water supply and wastewater system

Great Seneca uses 43% less water than other schools in the area.

# Water Efficiency

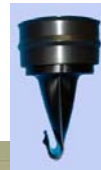
## Water Efficient Landscaping with no Irrigation

LEED Intent: Limit or eliminate the use of potable water, or other natural surface or subsurface water resources available on or near the project site, for landscape irrigation



## WATERLESS URINALS

- No need to flush
- Odorless
- Improves restroom hygiene
- Conserves 1.5 to 3 Gallons per use



**Did you know?**  
20 % of 1% of  
available fresh  
water in the  
world is flushed  
down the drain.




## WATER CONSERVATION

### Dual Flush Option

- Kindergarten
- Girls Restrooms on 1<sup>st</sup> floor

**1.6 gallons for # 2**  
**0.8 gallons for #1**






## WATER CONSERVATION

When washing your hands, don't let the water run while you lather.

**Did you know that ?**

- 97 % of all water in the world is salty.
- 2% is locked up in ice caps and glaciers.
- That leaves 1% for all our needs.



## LEED Category 3: Energy & Atmosphere



We have moved "to dependence on a finite stock of fossilized fuels whose remaining energy is now equivalent to less than eleven days of sunshine."

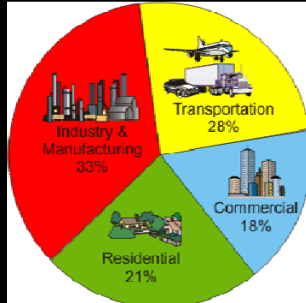
Christopher Flavin and Seth Dunn,  
State of the World 1999



*www.Schools2Green.org*

## Energy & Atmosphere

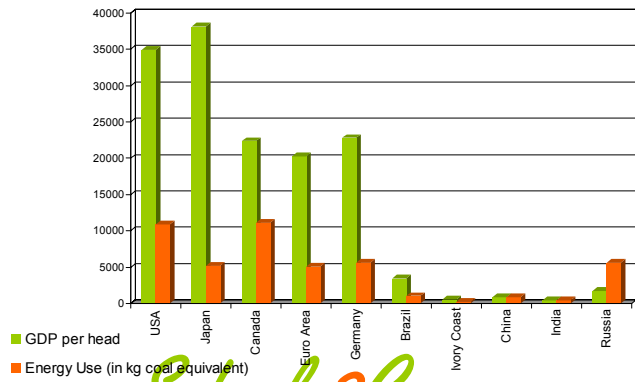
### Energy Use United States



Sector	Percentage
Industry & Manufacturing	33%
Transportation	28%
Commercial	18%
Residential	21%

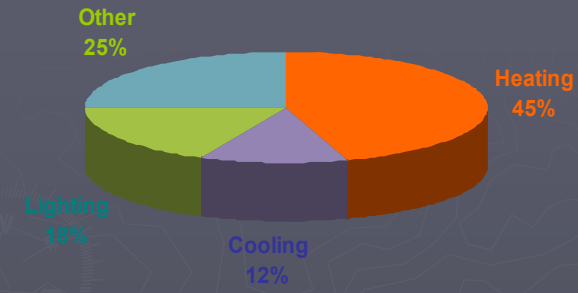
*www.Schools2Green.org*

## Global Energy Use & GDP



[www.Schools2Green.org](http://www.Schools2Green.org)

## MCPS Total Energy Use



2002/3	\$ 20 million	\$1.00/sf/year
2004/5	\$ 30 million	\$1.50/sf/year
2006/7	\$ 40 million	\$2.00/sf/year

MCPS Department of Facilities Management

[www.Schools2Green.org](http://www.Schools2Green.org)

Energy Waste by Users = 5%-15%

- Lights and Equipment OFF
- De-lamping
- Closing of Doors and Windows
- Operation of Blinds
- Energy Management Systems - Scheduling
- Portable Classrooms
- Kitchens and Cafeterias



MCPS Montgomery County Public Schools  
ROCKVILLE, MARYLAND

[www.Schools2Green.org](http://www.Schools2Green.org)

Renewable Energy – Green Power

- 5% of Montgomery County Power Procurement is from Green Power (like wind, water, geothermal)
- 100% of Great Seneca Creek and Little Bennett ES is supplied from "green sources"



MCPS Montgomery County Public Schools  
ROCKVILLE, MARYLAND

[www.Schools2Green.org](http://www.Schools2Green.org)

### Geoexchange at GSC ES

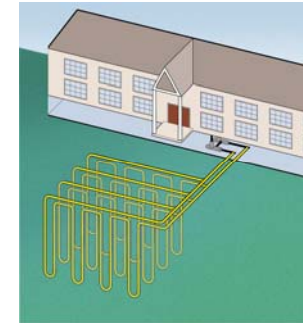
- 120 wells, 515 feet deep, 10 circuits
- approx. 130,000 ft (24.6 miles) of piping
- 13,000 gallons of 80% water, 20% glycol mix (food grade and biodegradable)



Montgomery County Public Schools  
ROCKVILLE, MARYLAND

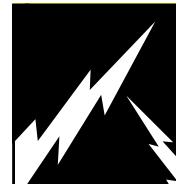
## Energy & Atmosphere

### Geothermal Field under the Ballfield



## Energy & Atmosphere

### Geothermal Field under the Ballfield

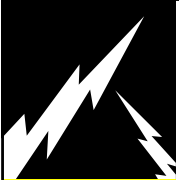


**SAVE  
ENERGY!**



## CONSERVE ENERGY!

**Generating Electricity causes pollution and global warming. Less than 30% of the electricity made by burning coal in Dickerson for our school is actually being used at GSC, the rest is lost in the transport.**


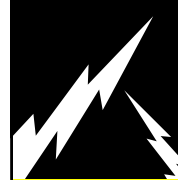


**SAVE ENERGY!**

# CONSERVE ENERGY!

Here is how you can help to protect the environment and prevent global warming in your classroom:

- Close the blinds at night.
- Turn off all the lights.
- Use daylight and only as many electrical lights as you need.
- Turn off computers and printers.





**SAVE ENERGY!**

Did you know?  
That oil comes from plants and animals that lived before the age of the dinosaurs!


# ENERGY CONSERVATION !

Thanks for saving energy  
I think we're all aware  
If we just do our share  
We'll set a pace, to help erase  
Pollution from the air  
We thank you,  
Yes we all thank-you for saving energy



Thanks for the memories

Courtesy of <http://www.wattsnew.com/wattsnew3/songs/jukeframes.html>

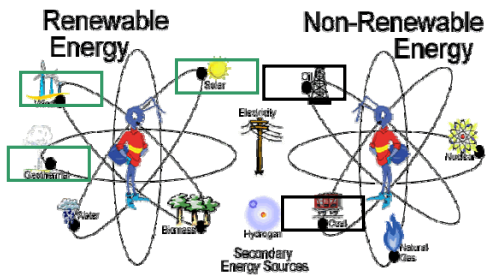


**SAVE ENERGY!**

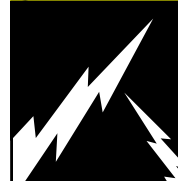
Did you know?  
That oil comes from plants and animals that lived before the age of the dinosaurs!

# RENEWABLE ENERGY USE @ Great Seneca Creek ES !

✓**GEOTHERMAL ENERGY**  
✓**WIND ENERGY AND SOLAR ENERGY** THROUGH GREEN PROCUREMENT



**Oil and COAL ARE NOT RENEWABLE & LEAD TO GLOBAL WARMING!**



**SAVE ENERGY!**

Did you know that the energy from the earth below your feet can keep you warm during the winter and cool during the summer ?

# GEO THERMAL ENERGY

Geo = earth      Thermal = heat

- Geothermal heat pump uses the constant energy from the earth to provide heating and cooling.


**Winter**

- A water solution circulates through the pipes buried in the ground, absorbs heat from the earth and carries it into the school!
- The heat pump concentrates the earth's thermal energy and transfers it to hot air circulated around the school.

**Summer**

- Heat is extracted from the air in the school (making the air cooler!) and transferred through the heat pump to the ground.





## GEO THERMAL ENERGY

Geo = earth      Thermal = heat


**SAVE ENERGY!**

Did you know that the energy from the earth below your feet can heat you up and cool you down ?

Geothermal heat pump uses the constant energy from the earth to provide heating and cooling.

- Geothermal energy is always available!
- Geothermal energy is reliable.
- Geothermal energy is local.
- Geothermal energy is endless!
- Geothermal energy is cheap.
- Geothermal energy doesn't emit CO2.

## LEED Category 4: Materials and Resources

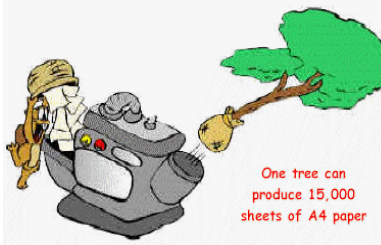



## Why recycle paper?

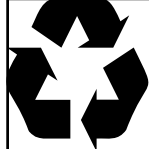
**Recycle paper!**

- Recycling paper means that less paper goes to landfill sites.
- Making paper from recycled paper uses less energy than Less producing it from **virgin materials**.
- Polluting chemicals are used to produce recycled paper than new paper.
- Because it saves trees, water and energy!

Did you know?  
That it takes 10 times as much energy to produce a new piece of paper than it does to make a copy on the second side.

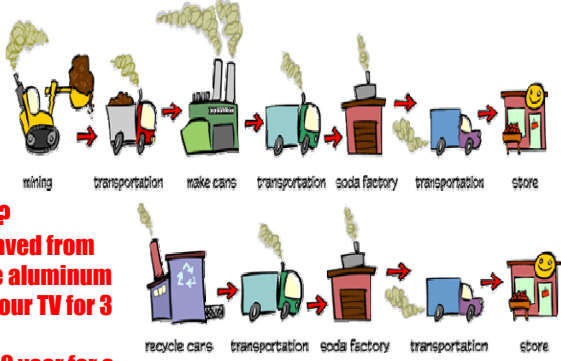


One tree can produce 15,000 sheets of A4 paper



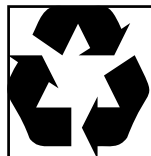
## Reduce, Reuse, Recycle

**Recycle !**



Did you know?  
The energy saved from recycling one aluminum can will run your TV for 3 hours.  
It will take 500 year for a soda can to break down.

Images courtesy of <http://www.alligatorboogaloo.com/kids/features/globe/globe004.html>



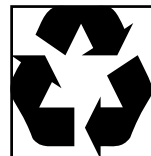
## Recycled Material

**Reduce,  
Reuse,  
Recycle,  
Respect!**

- Bathroom partitions are made of recycled plastic.
- Most plastic is made from oil.
- 1.8 ton of oil is saved for every ton of plastic recycled.
- There are over 100 different varieties of plastics.
- Look for the codes on plastic products. They help identify, sort and recycle the different types of plastics.

**Did you know?**

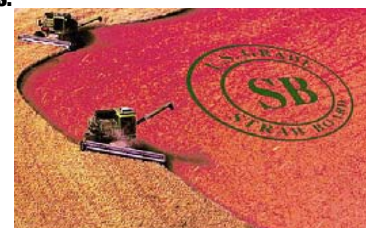
**4% of the world's annual oil production is used for plastic production and 3% is used during manufacture.**



## Wheatboard, a Sustainable Material.

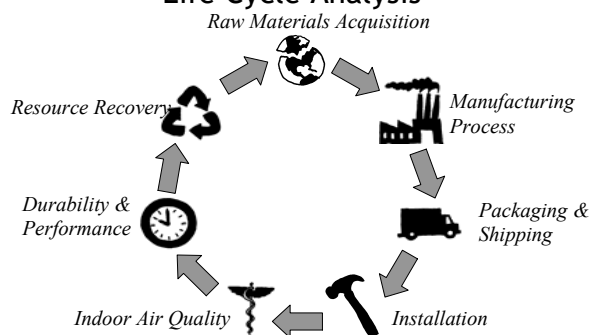
**Sustainable  
Materials!**

- Wheatboard casework is made from wheat straw and a polyurethane resin.
- Wheatboard is a renewable agricultural byproduct
- Wheatboard reduces waste, prevents pollution and saves trees.

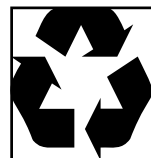


## Materials and Resources

Life Cycle Analysis



[www.Schools2Green.org](http://www.Schools2Green.org)



## Recycled Material

- Bathroom partitions at GSC are made of 100% post consumer recycled plastic.
- Most plastic is made from oil.
- 1.8 ton of oil is saved for every ton of plastic recycled.
- There are over 100 different varieties of plastics.
- Look for the codes on plastic products. They help identify, sort and recycle the different types of plastics.



**Did you know?**

**4% of the world's annual oil production is used for plastic production and 3% is used during manufacture.**

## Materials and Resources



Image by Mapquest

[www.Schools2Green.org](http://www.Schools2Green.org)

### Source of Materials

Transportation is costly in both energy use and pollution generation

Look for locally produced materials. Local hardwoods, for example, are preferable to tropical woods.

500 mile radius from jobsite (example: Washington, DC)

## LEED Category 5:

### Indoor Environment

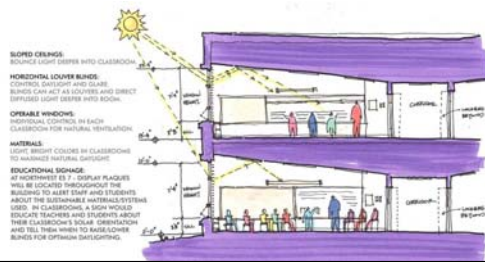


**Healthy Indoor Environment, Healthy Schools**

**Did you know?**  
Studies show that the indoor environment can effect your school performance.

## Indoor Environment

- Natural ventilation with operable windows.
- Natural daylight penetrates deeper into the classroom with higher windows.
- Controlled daylight and glare with louver blinds.
- Light, bright colors in classrooms to maximize natural light.



**Healthy Schools support Healthier Students & Teachers!**

## Indoor Environment

### GREEN HOUSEKEEPING GOALS

...to create a cleaner, healthier, safer and more productive indoor environment for the occupants and the custodial workers.

#### Products

- Select products to minimize exposure of cleaning staff and building occupants to hazardous substances.
- Select cleaning products that minimize impact on the environment.

#### Procedures

- Embrace cleaning procedures geared towards "cleaning for health" extracting a maximum amount of pollutants.
- Training
- Promote effective, efficient cleaning methods.
- Promote the safe use of cleaning products.



<http://www.rochestermidland.com/division/institut/ags.html>

# INDOOR AIR QUALITY

The diagram illustrates various sources of indoor air pollution and strategies to improve air quality in a school building. It shows a cross-section of a room with a ceiling, walls, and floor. Red wavy arrows indicate the flow of pollutants from different sources into the room. Text labels identify these sources and provide solutions.

- Outside air infiltration:** Red wavy arrows show air entering the building from the outside.
- Maximize flow of outside air through HVAC system to ventilate space:** A label pointing to the HVAC system in the ceiling.
- Maximize exhaust systems to purge pollutants:** A label pointing to an exhaust system in the ceiling.
- Off-gassing from ceiling tile:** Red wavy arrows show pollutants rising from the ceiling tiles.
- Off-gassing from paint:** Red wavy arrows show pollutants rising from a paint can on the floor.
- Off-gassing from carpet:** Red wavy arrows show pollutants rising from the carpet.
- Construction dust contaminates HVAC system if filters aren't used:** A label pointing to the HVAC system in the ceiling.
- Off-gassing from wallcovering and adhesives:** Red wavy arrows show pollutants rising from the walls.
- Remove pollutants at their source:** A label pointing to the paint can and wallcovering.

# Indoor Environment



IAQ Management Plan  
During Construction

# Access to Natural Light and Air

The diagram illustrates a cross-section of a building's work area, showing the flow of natural light and air. The building is divided into several zones: RESTRICTED OFFICE, CORRIDOR, OPEN WORKSTATION, and OUTDOOR OFFICE. The RESTRICTED OFFICE area is shown with a window looking out onto a green space with trees. The CORRIDOR and OPEN WORKSTATION areas are shown with large windows and glass partitions. The OUTDOOR OFFICE area is shown with a glass partition looking out onto a green space. The diagram includes labels for various features: VIEW TO OUTDOOR, RESTRICTED FLUORESCENT LIGHT FIXTURE, OPEN CORRIDOR IS MAINTAINED LIMITED 8' 0" CLEAR TO CLEAR OBSTRUCTIONS, PLANTS INTEGRATED INTO OFFICE DESIGN, OUTDOOR WORKSTATION OF CORRIDOR TO CORRIDOR, ELECTRICAL AND DATA WIRING, and GLASS AT OFFICES TO ALLOW EXTENSION VIEW FROM ALL WORK AREAS. The diagram is titled 'TYPICAL SECTION THROUGH WORK AREA'.

Environmental Defense by Envision Design

[www.Schools2Green.org](http://www.Schools2Green.org)

# Innovation and Design Process



**LEED Intent :** To provide design teams and projects the opportunity to be awarded points for exceptional performance above the requirements set by the LEED-NC Green Building Rating System and/or innovative performance in Green Building categories .







## Green User Education



## Future Projects

### ✓ Schoolyard Habitat Project



### ✓ Green Roof Project



### ✓ Wetland protection project

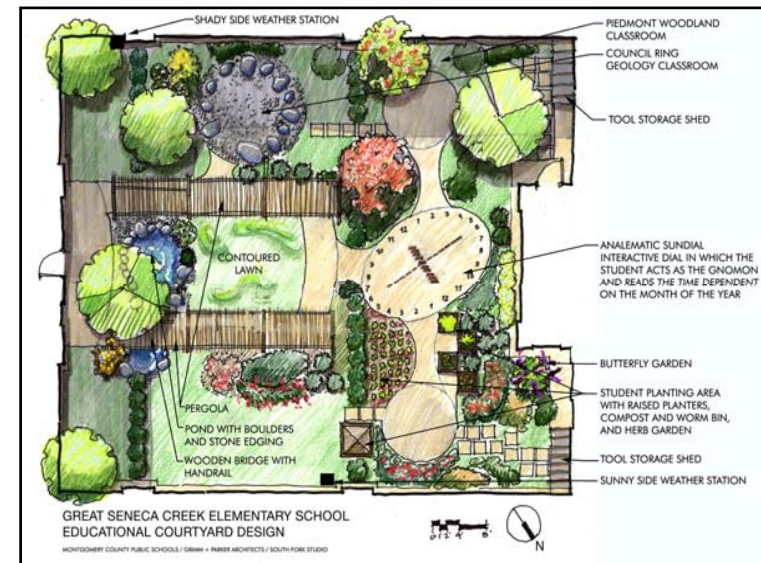


### ✓ Rain Garden Project



## Schoolyard Habitat

A Schoolyard Habitat at Great Seneca Creek ES will provide habitat for local and migratory wildlife and a teaching tool for Great Seneca Creek students.





[www.Schools2Green.org](http://www.Schools2Green.org)

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MCPS Montgomery County Public Schools  
ROCKVILLE, MARYLAND

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MCPS Montgomery County Public Schools  
ROCKVILLE, MARYLAND

[www.Schools2Green.org](http://www.Schools2Green.org)

[www.Schools2Green.org](http://www.Schools2Green.org)

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MCPS Montgomery County Public Schools  
ROCKVILLE, MARYLAND



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# **Great Seneca Creek Elementary School – Green Book**

## **5. User Education on Energy and Water Conservation**

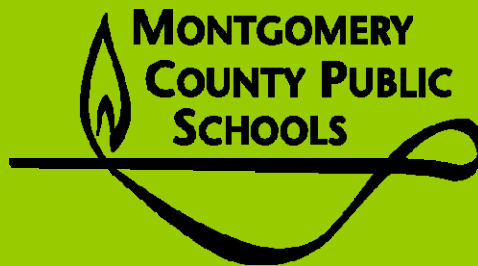
- SERT Handbook
- Car Pooling Policy

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# GREEN SCHOOLS FOCUS

Resource Conservation Strategies for  
Montgomery County Public Schools

# SERT HANDBOOK 2007





## **SERT Mission Statement**

To give school-based staff, teachers, and students ownership, responsibility and rewards for managing energy and water consumption. School-based personnel should be motivated to continually seek ways to conserve energy and reduce costs by eliminating energy and water waste and managing resources to ensure that our schools maintain a healthy and safe environment for learning.

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SERT –2006-2007  
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# SERT Handbook 2006/2007

## Resource Conservation Strategies for Montgomery County Public Schools

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##### School Energy Shut Down Checklist (Spring Break)

[http://www.mcps.k12.md.us/departments/facilities/greenschoolsfocus/pdf/ShutDownCheckList\\_SP\\_.pdf](http://www.mcps.k12.md.us/departments/facilities/greenschoolsfocus/pdf/ShutDownCheckList_SP_.pdf)

##### School Energy Shut Down Checklist (Winter Break)

[http://www.mcps.k12.md.us/departments/facilities/greenschoolsfocus/pdf/ShutDownCheckList\\_WN\\_.pdf](http://www.mcps.k12.md.us/departments/facilities/greenschoolsfocus/pdf/ShutDownCheckList_WN_.pdf)

##### School Energy Shut Down Checklist (Long Weekend)

[http://www.mcps.k12.md.us/departments/facilities/greenschoolsfocus/pdf/ShutDownCheckList\\_LW\\_.pdf](http://www.mcps.k12.md.us/departments/facilities/greenschoolsfocus/pdf/ShutDownCheckList_LW_.pdf)

##### School Energy Shut Down Checklist (Summer Break)

[http://www.mcps.k12.md.us/departments/facilities/greenschoolsfocus/pdf/ShutDownCheckList\\_SU\\_.pdf](http://www.mcps.k12.md.us/departments/facilities/greenschoolsfocus/pdf/ShutDownCheckList_SU_.pdf)

##### SERT Action Plan

[http://www.mcps.k12.md.us/departments/facilities/greenschoolsfocus/pdf/FY07\\_SERTActionPlan.pdf](http://www.mcps.k12.md.us/departments/facilities/greenschoolsfocus/pdf/FY07_SERTActionPlan.pdf)

##### Resource Conservation Plan

[http://www.mcps.k12.md.us/departments/facilities/greenschoolsfocus/pdf/MCPS\\_RCP\\_2007.pdf](http://www.mcps.k12.md.us/departments/facilities/greenschoolsfocus/pdf/MCPS_RCP_2007.pdf)

##### EMS Guidelines for Energy Management

<http://www.mcps.k12.md.us/departments/facilities/greenschoolsfocus/pdf/GuidelinesforEMS.pdf>

##### ERT Work Request

<http://www.mcps.k12.md.us/departments/facilities/greenschoolsfocus/pdf/ERTWorkRequestInfo.pdf>

##### MCPS Recycling

<http://www.mcps.k12.md.us/departments/recycling/index.html>

##### SERT/Green Schools Club Meeting Record

<http://www.mcps.k12.md.us/departments/facilities/greenschoolsfocus/pdf/SERTClubMeetingRecord.pdf>





## Introduction

"Energy may be the most important environmental issue of our time. If you think about nearly any other environmental issue—air or water quality, land use, transportation, global climate changes, or solid waste management, to name some examples—you will find that it is related to the issue of energy. Energy affects our lives everyday. It keeps us warm in the winter and cool in the summer, affords us the freedom to travel to far away places, and keeps our food fresh and safe to eat. Energy is not just an environmental issue; it is a quality of life issue, too."

Reprinted with permission from Project Learning Tree, Energy & Society Energy Education Pre K-8 Activity Guide. Copyright, 2002, American Forest Foundation

This guide book is for students, staff, parents and community—everyone supporting and participating in Montgomery County Public School's (MCPS) School Eco-Response Team (SERT) program. Our goal is to maintain a healthy and productive learning environment for faculty, students, and staff while reducing energy, water, and other resource use as much as possible.

All MCPS schools participate in either SERT or Green Schools (for middle and high schools) and all schools are required to file a SERT plan. Each school is challenged to save at least 5% in electricity over the set base line.

A school's level of student participation and activity will have a direct impact on the amount of energy savings achieved. Energy management in schools is not the sole responsibility of the building service staff. Each of us must look at our own energy consumption habits and ask: "Is this a wise use of this resource?"

It is our sincere hope that your school's participation with SERT will result in a learning experience for all involved.

## SERT 2006-2007 Water and Energy Conservation Program Outline

Fiscal responsibility and resource stewardship go hand-in-hand in ensuring that the MCPS operating budget stretches to cover all essential educational needs. If we can collectively reduce energy waste, we can preserve teaching jobs and other essential educational priorities.

### Participation in SERT is mandatory for all Montgomery County Public Schools.

- All schools must complete a SERT Action Plan and should achieve at least a **5% reduction in total energy use** over the school year. The following outlines the program and the incentives Green Schools Focus offers to help schools achieve this goal:
- A new and current **SERT Action Plan** with designated staff must be submitted by September 30th of each year. This deadline coordinates with the County's Recycling Plan deadline.
- Principals' support of the SERT team is strongly encouraged to establish school-wide awareness, to promote environmental stewardship, and to ensure proper use of awards. The Principal's Handbook provides the energy conservation guidelines that should be followed for efficient building management.
- All schools receive assistance from a SERT Energy Facilitator. The SERT Energy Facilitators support the SERT team's efforts in energy conservation.

### Annual SERT Conservation Awards for Energy Savings and Good Behavior

- SERT awards \$500 per quarter to the top fifth of schools (approximately 30 schools) that show the best energy savings against the baseline year. This award goes to the school; however, in the summer quarter (June-August), the award goes to the building service supply budget in the school.
- In addition, SERT will make \$500 awards each quarter to schools demonstrating **good energy conservation behaviors**, whether or not their energy data shows savings. Good Behavior awards are based on observed conservation practices.
- Green Schools are eligible for quarterly Good Behavior awards. They earn performance awards of up to \$5,000 for school year electricity savings over the baseline year.
- Green Schools Leadership Stipends are available to any educator that directly supervises students in energy saving actions on a regular basis outside the classroom (i.e., club or after school time.) These awards are \$200 per quarter.

## **SERT Website**

**[www.greenschoolsfocus.org](http://www.greenschoolsfocus.org)**

The SERT Office maintains a comprehensive website, [www.greenschoolsfocus.org](http://www.greenschoolsfocus.org), accessible through any internet browser. The website provides schools with up-to-date news, educational opportunities, field trip suggestions, activity ideas, links to fun energy websites, and supplemental curriculum resources. The website also posts current energy use for each school. Schools will find this under Energy Data on the site. The website is part of the MCPS Green Schools Focus that further contains information about the green building activities at MCPS.

### **Classroom Materials**

Every year, the SERT Program provides assistance for teachers at elementary, middle school, and high school levels who want to integrate energy and water-related concepts and topics into their on-going classroom activities. Our objective is to help students understand the implications of energy use and savings as well as how the SERT Program relates to larger issues of global environment and energy security.

The SERT website includes materials developed by the nonprofit Alliance to Save Energy, which has a national program called Green Schools. Materials developed for MCPS teachers in the SERT Green Schools Program will be available each fall at the SERT meetings, Green Schools summer professional development, and on the website.

## **The SERT Team**

The one common factor for successful SERT schools is that they have developed a coordinated team effort.

**SERT works** when there is cooperation among the faculty, administrative and building services staff, and the students. It can be frustrating those trying to save energy feel that there is no support or interest. So the first step is to:

### **Assemble a dedicated team**

Team members don't have to be engineers; they just need to be willing to contribute. Teams should include students who will have unique approaches for involving other students and staff. Teams should include a member of the building services staff and at least one teaching staff.



**Give the SERT leader authority**

SERT is not about fancy gadgets or magic devices. It is about changing people's habits. Having the principal's visible and continuing support concerning energy issues can go a long way in encouraging people to change their habits.

**Produce a cooperatively-written SERT Action Plan**

Lee Iaccoca said, "The discipline of writing something down is the first step in making it happen. Give ideas life by committing them to a written plan." Brainstorm to find new and innovative ideas that will work for your school and fit your needs. Develop the ideas into priorities for immediate action.

**Make reasonable deadlines**

If you want to get it done, plan to do it.

**Meet monthly to evaluate performance**

Follow up on activities. Make them happen.

## **Activities for Student SERT Teams**

Schools participating in the SERT Program have many activities to choose from and even create their own ideas to improve SERT savings and take advantage of the opportunities of SERT. Most schools in the SERT Program have some sort of building management program in place. This program may include removing unnecessary lighting, keeping lights and computers turned off when not in use, and keeping their energy management (EMS) calendar up-to-date. In addition, some schools also pursue a SERT Program that includes students and creative approaches to getting the word out on energy savings and developing an eye for energy waste in faculty, staff, and students including:

**Measure light levels and delamp where possible**

At Rock Creek Valley ES, students worked with building service staff to take measurements of actual light levels in hallways and classrooms. They found much of the school was over-lit. Lamps were removed and light levels, while lower, were still above the MCPS standard. Most importantly, staff and students didn't notice any differences. The school saved 5% percent in electricity consumption and was awarded \$1,000 for second and third quarters for good conservation behaviors.

**Finding the Win-Win Solution**

The SERT Team at Fallsmead ES conducted an energy audit at their facility. They found many of the staff members had their own personal appliances such as: microwaves, toaster ovens, coffee makers and mini refrigerators throughout the building. After talking to some of the staff members, the team learned that the staff lounge wasn't convenient for everyone. They removed many of the personal appliances and consolidated some of the extra appliances to set up mini staff lounges in two of the resource offices in order to accommodate everybody. This action reduced their energy consumption immediately. Fallsmead ES is saving over 10% every quarter.



## **Listen to your students and let them lead**

At Page ES, Green Team students and staff hold bi-monthly lunch meetings with their principal. During these meetings, they discuss strategies on how to conserve energy and reduce energy waste. Each meeting brought about new and innovative ideas that led their school to dramatically decrease its energy usage. At the end of the school year, the students were very proud of their Green Team and their accomplishments.



## **Let students create an original message**

Christa McAuliffe ES has an effective way to remind students and staff to turn off lights when not needed. Student-created designs are laminated and placed in each classroom. Each reminder is unique and students proudly show off “their” sign at Parents Night. There is the added bonus that each art class becomes invested in the message of school conservation.

## **Peer teaching works on many level**

As part of their Green Schools Program, Martin Luther King MS students created and then taught an original energy conservation lesson to elementary students at nearby Lake Seneca ES. The videotape produced as a result was a fun and clever way to involve many more students and empower the middle school students as teachers. The younger students are clamoring for a return visit.

## **Use data to track SERT success**

The Glenallan ES G.E.T.T.E.R.S Club consists of 4<sup>th</sup> & 5<sup>th</sup> grade students and staff who wanted to make a difference at their school. By identifying and correcting wasteful energy practices, the G.E.T.T.E.R.S saved 20% in electricity use over the school year. A data chart was prominently displayed in the school that tracked the conservation progress. This increased involvement for all students and staff and helped school visitors and parents understand about the program.

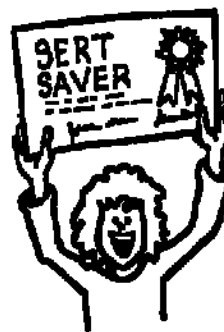
## **Compile an Energy Cheat Sheet for Each Room**

Any piece of equipment we buy today comes with a manual. Every room in a building is a little different. Therefore, it needs to be operated in different ways to make it most energy efficient. You can come up with an energy cheat sheet flyer for your classroom that instructs the user about the care of the equipment in the room at different times of the day and year. Some checklist items to include are if the blinds should be up or down and when, when to vacuum the refrigerator coils, when the task light should be used by the teacher after class, and what to shut off when the room is empty. This should be hanging close to the door so that any user has access to it. Many schools are used by the community after hours. There is a schedule for that at the Main Office. Make sure whoever uses the room after the class is gone is familiar with your manual and will promote turning off lights and equipment when people leave at night. Adults are the most difficult to educate about energy conservation, so be patient but persistent.

## Recognize Effort and Promote Your Program

The SERT program is like any good habit. You have to keep up your effort every day. Keeping people motivated is very important to the success of the program! Recognize and reward individual and team effort with certificates, awards, and greater responsibilities.

SERT teams have used everything from tie-dyed T-shirts and aprons to paper ribbons to identify the students in the light patrols. Contact the SERT office to learn about other ways to promote your team's conservation efforts or to receive Certificates of Appreciation for special recognition at your school.



Promote your program within the school with morning announcements, newsletter articles, and flyers. Ask for support and assistance from your PTA and community user groups. Their energy use will affect the entire school.

Use the SERT Newsletter to promote your projects. Call in your stories and schedule a time for photographs. If your students are featured in an article, make sure you get extra copies to pass out to parents!



Congratulations to our Green Schools Student Leadership Award Winners Mikayla McDonald (Churchill HS) & Rachel Blair (Paint Branch HS) pictured with Dr. Jerry Weast, Superintendent of Schools, and Richard Hawes, Director of Facilities Management.

# ***SERT Frequently Asked Questions***

## **GENERAL**

### **Q. How are SERT awards determined?**

SERT Awards will be based on either of the following two performance criteria (1) verifiable energy savings and (2) observed good energy behavior. The energy savings are verified through energy bill analysis. Good energy behavior is verified by your school's assigned SERT Energy Facilitator or other Energy Resource team members as part of site visits. These visits may take place during school hours, after school, or in the evening.

### **Q. What can I do with my awards?**

The SERT office recommends that award monies be spent on materials and services that further the environmental goals of the program. Stipends for building services and other involved staff attending training are appropriate uses of award monies, as are t-shirts or other team building identification for students. For further ideas on how to spend your SERT money, please visit our website at [www.greenschoolsfocus.org](http://www.greenschoolsfocus.org) or the direct link as follows:  
(<http://www.mcps.k12.md.us/departments/sert/SERT%20Awards%20Flyer.pdf>)

### **Q. What other assistance is available to help my school implement additional ideas and efforts?**

Green Schools Focus provides training open to all MCPS schools at the beginning of each school year to help support their SERT team. The trainings will be conducted by the SERT Energy Facilitators. Throughout the year, Facilitators will visit your school to provide advice and hands-on assistance. Green Schools tracks the energy consumption of your school and relays that information periodically to principals, SERT captains and community superintendents. In addition, MCPS offices of Energy Management and Division of Maintenance will address temperature issues relating to a building's heating and cooling both during and after-school hours. Please see the Appendix for information on submitting a work order dealing with temperature issues.



### **Q. What can schools do to conserve resources when outside groups are also using the building?**

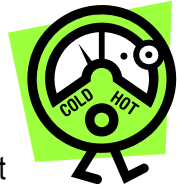
With the growing needs of our communities, our schools are operating long into the evenings and year round. Before and after-school programs, adult night education courses, community meetings, and weekend activities are just a few. With additional usage of the buildings, there also comes an increase in energy and water consumption. This can be an opportunity to build wider awareness of the school's efforts to conserve resources and save taxpayer dollars. To spread the word, SERT teams should post special notices in areas most used by those groups. Organize a meeting with your local community cluster to discuss strategies to conserve energy and water during after-school hours. Let community users know that their use of excessive lights or practices of leaving outside doors open when the building is being heated or cooled directly impacts your school's energy consumption. You'll find more people are willing to cooperate if they are made aware of your goals. Consistent and clear communication is one of the main keys to a successful SERT program.



## Heating and Cooling

### Q. Who controls the operating schedules for heating and cooling in my school?

There are two basic methods used to control the heating and cooling in MCPS schools. The most common method is with computer controlled energy management systems. A calendar of your school's monthly activity (normal school hours, plus evening community use) is used to determine the operating schedules for the heating and cooling systems. If there are any changes to the schedule, Energy Management Systems must be contacted to make the appropriate changes. Some schools are not hooked up to the energy management system. In those cases, the building service manager has direct control of the heating and cooling equipment. Either way, the operating periods of the heating and cooling systems are determined within the school, not by SERT or an outside office. Reduction of after-hours use of the building and consolidated after school use into one heating/cooling zone supports energy conservation.



### Q. What are the correct temperature settings for heating and cooling?

The standard temperature setting during the heating season is 70°F. For the cooling season, the temperature setting is 76°F. Everyone has a different comfort level at different temperatures, especially at different levels of relative humidity. How comfortable you feel depends on your physical ability to adjust and how appropriately you are dressed for each season. Layering clothes keeps you more flexible.

### Q. What should I do if I see examples of waste?

If it is as simple as turning off the lights, just do it! Be proactive and help everyone by modeling energy-aware behavior. Use these opportunities, when appropriate, to educate others.

### Q. Are electric space heaters allowed in the school?

Electric space heaters are against MCPS policy. These units, in addition to having high energy costs, are a fire and safety hazard. Only heaters installed by the Division of Maintenance for emergency use will be permitted; others will be confiscated. For alternatives, see our website.

### Q. What can I do if the room is too cold/hot?

If your room temperature is uncomfortable, measure the actual temperature and then call the building service manager. If necessary, have the thermostat setting checked. Also, check to make sure the unit ventilator is not blocked. The area on top with the vents, as well as the bottom of the unit, needs to be clear. If either top or bottom is blocked, then it will waste energy and leave you more uncomfortable. Space heaters are not allowed in the school building and can corrupt the thermostat readings. Do not forget to collect information on actual temperature and thermostat readings before you contact Energy Management Systems.

## Lighting

**Q. In our school, what is the biggest consumer of energy?**

The biggest consumer of energy is heating, followed by fans, cooling, plug loads, and then lighting. The heating/cooling system stays balanced by keeping doors and windows closed. Plug loads, like personal refrigerators, computers and printers, and lighting, are the loads that can be easily controlled by shutting things off.

**Q. Does it actually cost more to turn the fluorescent lights off for a minute, than to leave them on?**

No! Modern fluorescent lamps are "rapid start" or "instant start." Once you turn them off, you will start saving energy immediately. There is no appreciable increase in energy use to start them again. So the next time you say, "I'll be back in a minute," and then return 20 minutes later, consider how much you could have saved by turning off your lights!

**Q. Does the lighting system use more energy if a tube is removed from a fluorescent fixture?**

No. The current to remaining tubes increases marginally (a watt per tube), but electric consumption is reduced by 40 watts per tube on the older T-12 system, and 32 watts on the newer T-8 lights for each one removed. Call your SERT Facilitator to borrow light meters to check areas that you feel may be over lit.

**Q. Will I burn out the ballast if I take a tube out of a fluorescent light fixture?**

Your ballasts will NOT burn out by removing tubes. A ballast is an electrical component used in fluorescent lighting systems. The manufacturers' design engineers state that heat from electrical current degrades the ballast. With less current, there is less heat, thus less wear. Ballasts do fail for a variety of reasons, but not because a tube was removed.

## Computers

**Q. Will I kill my computer or software if I turn off the computer?**



Always follow the procedures to exit your software programs before turning off your computer. The general rule of thumb for the components is to treat your computer as you would your television. Why leave a TV on when no one is watching? If you are having problems with your computer, it is most likely due to a hardware or software glitch, not anything to do with turning the computer off. The most energy is used by your monitor, so if you are really just going to be gone for a short

time, turn the monitor off and leave the computer on. If you are gone longer than five minutes, turn it all off. These days, restarting your computer often is more beneficial than harmful. Remember the most frequent computer fix when you ask IT staff -"Did you restart it?"

**Q. How much energy does a screen saver save?**

None! The screen savers prevent the monitor screen from burning in an image displayed over a long period of time. But that does not save energy. Sleep programs, which darken the screen, actually do save energy and should be enabled on all computers so equipped. The most energy is used by your monitor, so if you are really just going to be gone for a short time turn the monitor off and leave the computer on.

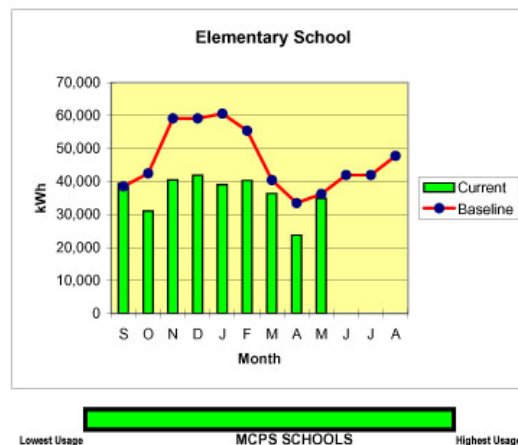
## School Data

**Q. How can I check my schools data?**

The Green Schools Focus office posts each school's energy use data on our website ([www.greenschoolsfocus.org](http://www.greenschoolsfocus.org)). Follow the link on the main page to Energy Data. The data is available for each school. Below you will find a sample Energy Chart.

**Elementary School  
Electrical Consumption (kWh)  
FY06 School Year (2005-2006) vs. Baseline Year**

Month	Current	Baseline	%Change	Current YTD	% Change	kWh/Sq.Ft.
September (S)	39,360	38,520	2%	39,360		
October (O)	31,080	42,480	-27%	70,440		
November (N)	40,440	59,160	-32%	110,880	#####	#####
December (D)	41,880	59,160	-29%	152,760		
January (J)	39,120	60,610	-35%	191,880		
February (F)	40,320	55,400	-27%	232,200	#####	#####
March (M)	36,360	40,440	-10%	268,560		
April (A)	23,760	33,480	-29%	292,320		
May (M)	34,920	36,240	-4%	327,240	#####	#####
June (J)	0	41,971				
July (J)	0	41,971				
August (A)	0	47,760				
<b>Total FY06</b>	<b>327,240</b>	<b>557,192</b>	<b>-41%</b>	<b>327,240</b>	<b>-41%</b>	<b>#####</b>



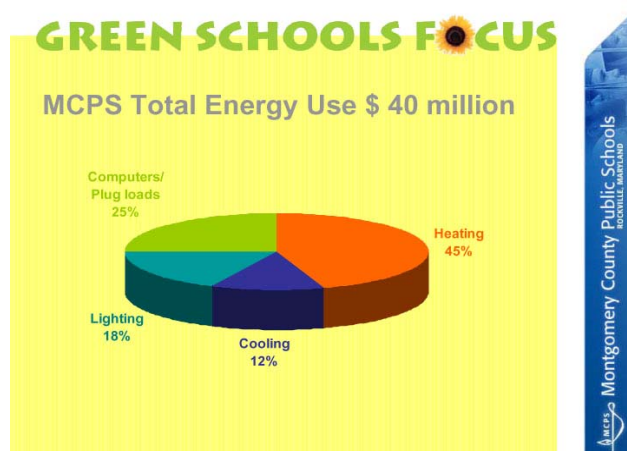
## Energy Conservation

### Lighting Strategies



The biggest consumer of energy in MCPS buildings is heating, followed by computers and plug loads, lighting, and then cooling. Energy consumed by lighting is the easiest for us to modify without any major expense. First, we have direct control at the switch. We can use the switches to control banks of lights in classrooms, halls, and so on.

Second, we can control how long the lights will operate. Third, we can simply remove selected lights from the fixtures to control the amount of light in an area. How far you decide to modify your lighting system depends on your school's particular lighting system and conditions.



### Turn off the lights, turn on the savings

Turning off the switch is the easiest saver. The potential savings from turning off the lights is very high while the inconvenience is really very small. The entire school can help with this action. Consider turning off lights in hallways that have large window areas, the bank of lights in classrooms along the windows, and in school entry areas where there is a lot of natural light.

### SERT Patrols

Patrols work very well with elementary students. It is easy, action oriented, and the children have a lot of fun. Under the direction of a teacher and armed with SERT post-it notes and stickers, the students check for unoccupied rooms where the lights are left on. They leave post-it notes and stickers to remind classmates, teachers and staff to turn off the lights when they leave the room. Some light patrols leave a thank you or draw a happy face on the post-it note where they find the lights turned off. Some give tickets. Students can also check computer monitors and other equipment left on when not needed.

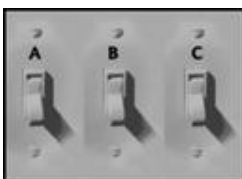


Implement a daily check to turn off unneeded lights. It is a good idea to schedule a light patrol before lunch and after school and to include the portable classrooms.

If you need help in starting a student SERT patrol, check our website for a PowerPoint on the subject.

## Switch to Habits that Save – Use Multiple Switches Effectively

Where it is possible, use the area's light switches to control the banks of lights that are being used. Experiment with the switches to see how they control the lights. Select the area which is being used and turn on the lights for that specific area. Why light up the back wall when everyone is facing forward? You can use this simple but effective technique in the all-purpose room, hallways and even classrooms. All too often, we turn on all the lights in the room out of habit, not out of need. Try to avoid running banks of lights next to windows. Often there is adequate natural light to get the job done.

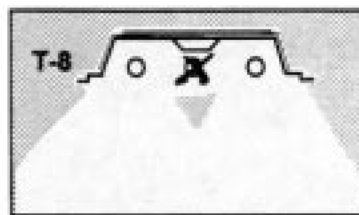


## Delay the Costs – Keep it off until needed

In the old days when energy was cheap, we would enter an empty building and immediately turn on all the lights. At 6 a.m., everything was on and ready to go. A more efficient habit is to delay turning on the lights in vacant parts of the building until people arrive. You may be able to save an hour or two everyday without causing anyone any inconvenience.

## De-lamping

In most of our classroom light fixtures, there are one to four individual fluorescent lamps. Depending on the types, you can remove some of the lamps while keeping the others on. The fixtures that have the large 1.5 inch diameter lamps (T-12) must be taken out in pairs, either inboard or outboard. The T-12 diagram shows a de-lamped fixture with two inboard lamps out. Which pair to take out simply depends on which appears best to you. On the newer, skinnier lamps (T-8), the manufacturer recommends no more than one lamp be removed from the fixture. Of course, you can also remove all the lamps in a fixture if the light is not needed. Have an electrician disconnect the ballast if you are sure the light will not be needed.



## Rules for De-lamping

- Do not compromise health, safety & security
- Do not take lamps out of new fixtures under warranty
- Do consider people's needs
- With T8 systems, do not remove more than one lamp per fixture
- Keep minimum light levels

## Where would you de-lamp a light fixture?

De-lamping is possible anywhere there is a fluorescent light fixture above an area that is not being used for active reading and writing or in areas where there is more light than needed. This could include the following areas:

### Classrooms

- Especially along windows
- Around doors, corners and coatrooms
- Over computers, televisions & equipment
- Over play areas
- Desk surfaces for reading should have 30-50 footcandles

## Hallways / Stairways

- Around windows and skylights
- Corridors off the main hall
- Hallways should have 10-20 foot candles (lumens)

Light meters are available to loan to SERT teams from the SERT office. Call us for more details.

RECOMMENDED FOOTCANDLE (FC) LEVELS FOR VOLUNTARY SERT DE-LAMPING PROJECTS	
Corridor and Stairways	10 -20 fc
▪ As low as 10fc – for high reflectivity flooring/walls (white or pastel)	
▪ Up to 20 fc for dark-colored flooring	
Conference Rooms	30 fc at table height
Reception Areas	20 fc (avg. ambient) 50 fc (on task surface/desk)
Classrooms	30 fc (reading/ writing)
Art class	75 fc (preferably natural lighting)
Computer labs	15 fc
Restrooms	15 fc
Gyms	30 fc
Cafeteria (seating area)	30 fc
Cafeteria (food prep area)	75 fc

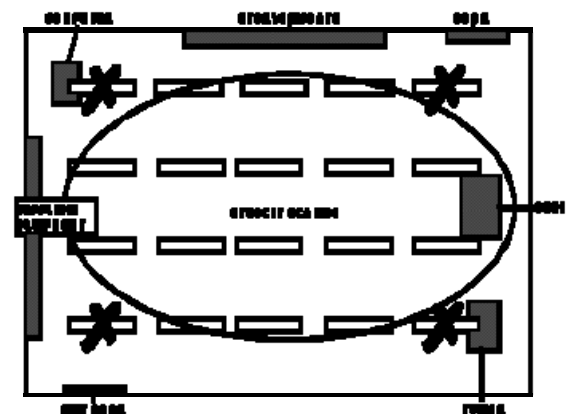
## Customize Your Classroom

When a lighting system is designed, most of the time the entire floor area is covered end to end with an equal amount of light. When we customize the lighting, the idea is to put light where it is needed, and de-lamp where light is not needed.

There are no standard rules for customizing classroom lighting. Flexibility is the key. Every teacher will set up their classroom to meet their style and methods. Furthermore, every teacher will need a different level of lighting for comfortable vision. Customizing works best when the teacher and the building service manager work together to find the best solution.

One building service manager came up with the idea of mounting cardboard on a pole in order to block out the light from a light fixture. That way he could go around the classroom with the teacher and select specific fixtures to de-lamp. The teacher could see how the classroom would look without any guess work.

As shown in the example room, you can easily de-lamp over doors, computers, TV/VCR, and storage areas. Keep the lights over the student's study areas where they will be reading and writing. Here you want about 30 footcandles. De-lamping also has the benefit that if conditions change, the lamps can easily be replaced by in-house staff.



## Eye to Eye...and After Class

Young healthy eyes are able to adjust to a wide range of light levels without difficulty. As people age, their eyes become less flexible with varying levels of light and detailed work becomes harder. Keep this in mind as you ask teachers to de-lamp. What may be appropriate for one person may be unsuitable for another. Consider task lights with CFLs at work areas to increase light levels at the work surface. Lighting consumption after regular school hours can be greatly reduced if teachers switch off overhead lighting and rely instead on "task" lighting, like a desk lamp. For good measure, equip that lamp with a CFL (Compact Fluorescent) rather than incandescent light bulb. Energy efficient lighting design today should be about 1.5 watts per square feet. With modern technology that could come down to 0.9 watts per square feet.

## I Can See Clearly Now...

Dirt and dust can reduce the output of your lamps by as much as 20% within a year. Keep the lights their brightest by cleaning the light fixtures, diffusers, and tubes. Normal maintenance procedures call for an annual cleaning; but depending on room conditions, more frequent cleanings may be called for. Diffusers are the plastic covers over the lamps. Over time the diffusers can turn yellow/brown and significantly reduce light output. Unfortunately, this discoloration cannot be cleaned off. For safety, the diffusers should not be discarded leaving the fluorescent lamps exposed. Try relocating the yellowed diffusers to another fixture where lighting is not critical. De-lamped fixtures would be a good place to locate yellowed diffusers. Put the newest and the brightest diffuser where good quality lighting is most needed.

## Gym and Outdoor Lights

Your gym may have metal halide or mercury vapor lamps instead of fluorescent lights. It is not practical to try to turn mercury vapor lights on and off for short intervals because these lamps need a few minutes to re-light. The best SERT strategy is to schedule when the lights are turned on and to control the number of banks used with the switches. Mercury vapor lamps consume 200 to 400 watts each (depending on the type), so the potential savings from controlling these lights is very significant.

Ensure outdoor light controls are working properly. Outdoor lights are usually controlled by timers or photo-electric cells. With the timer controls, make sure they are set correctly according to changes in seasons. Also, be sure to check if your timers can be affected by a thunderstorm. Photo-cell controlled lights that are on during the day indicate that the sensors have failed.

Outdoor lights that are left on during the day are a complete waste of energy. This also announces to the community that we are not being careful about energy use. Fortunately, this is an easy problem to spot and correct. It just takes developing an eye for seeing energy waste.

Latest research shows that night time security is improved by eliminating outdoor lighting or tying it to motion sensors. **MCPS policy also requires parking lot lighting to be turned off between midnight to 6:00a.m.** Talk to your SERT Energy Facilitator about adjusting the exterior lights at your school.

## Electric Lighting

**Rooms with no natural light:** Post "lights off" signs in rooms that are not always occupied and have no windows, like restrooms, storage areas, gyms, and copy rooms. In some cases, occupancy sensors may make sense, so the lights turn off automatically. Check with your SERT Facilitator. The benchmark is 200 watts per room.



**Areas with natural light:** These are the electric lights that are most likely to needlessly stay on all day and waste energy, because once the sun is out people do not even notice that they are on anymore. These areas are often stair cases, perimeter hallways, classrooms, lobbies, offices, media centers, and cafeterias (see example to the right).

The Light Patrol and/or building services should make it part of their routine in the morning to turn off lights that will not be needed during daytime anymore - it helps to make a list of those lights.

**Emergency Lighting:** Many BSMs are using just the emergency lighting with natural daylight to illuminate hallways. Regular lighting is used after dark and when it is very cloudy outside. Emergency lights may also provide adequate light levels for corridors after school hours—use the light meter to check.

## Conservation in Classrooms

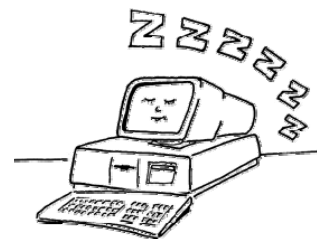
**There are many strategies that will work in almost any classroom. Consider the following:**

- Assign a student to turn off the lights when leaving the room. You may want to give them the title of classroom energy manager and the responsibility to look for other opportunities to save.
- Arrange your room to take advantage of natural light.
- Use the switches to control light banks in the room.
- Be aware of activities that provide an opportunity to lower light levels such as story time or when using an overhead projector.
- Use the blinds to allow natural light into the room. Adjust the blinds so that light reflects off the ceiling to prevent glare while spreading light over as much area as possible.
- The blinds work as insulators, too. Close them at night in the winter to help keep the heat in. Open them during the day to gain the additional light.
- Keep the lights off in coat rooms and storage areas until needed.
- Keep blower vents clear and unobstructed. When the blower unit is blocked, it has to work harder to heat or cool. It is like driving your car with the brakes on.
- Have a task light on your teacher's desk and turn out overhead lights when students are out of the room.
- Eliminate the use of electric space heaters, which are against MCPS policy. We also strongly discourage the use of auxiliary electrical appliances such as mini refrigerators. For alternative ideas, contact your SERT Energy Facilitator.

## Computer Use

“Shut down the computer at the end of each use, unless a new user is waiting and turn off the monitor. Only LAN Fileservers should be on 24 hours a day.”

Turning your computer on and off by following the proper shut down procedures will not hurt your hard drive or programs. Keeping your computer on 24 hours a day is like keeping your television on for 24 hours. It just does not make good sense.



There are a few occasions when turning the computers on and off would be a considerable inconvenience. In that case, just turning off the monitor will save half the computer's energy use.

The exceptions are "Energy Star" systems. These will go into a sleep mode after a set period of inactivity. If your monitor has this feature, be sure it is activated. SERT recommends that computers be shut down at the end of the school day. When performing a manual shut down, be sure to follow the correct power-down procedures. Also, don't forget to turn off the printer(s), scanner(s) and any other computer equipment.

### **File Servers need to stay on 24 hours a day.**

To save energy with File Servers, turn off the monitors if you can. You only need the monitor when you are working with the programs. Place a sign on the monitor stating, "The file server is to remain on at all times, the monitor is off for energy conservation."

### **Printers should only be turned on only during working hours.**

Assign someone to shut down printers, scanners and other office equipment at the end of each school day. Printers in classrooms should be shut down overnight. The exceptions are those printers which are connected to computers that receive printout alarms such as the energy management computers.

### **For Your Viewing Comfort**

To increase comfort for computer users, reduce the lighting at computer stations. Glare, eye strain, and fatigue are all related to lighting that is shining on the monitor. Adjustments can be as simple as experimenting with the switches and utilizing the window blinds. Adjust the blinds so light is bounced off the ceiling, giving a more diffused and subtle lighting. In classrooms, resource rooms and the media center, try removing some lamp tubes in fixtures over the computer. Typically, 15 foot candles are enough.



In computer labs, use torchieres with a compact fluorescent lamp and switch off all the overhead lights. Lighting the wall and ceiling areas is more comfortable for computer users and eliminates reflective glare on the screens.

## **Office Equipment**

The fastest growing energy users in many buildings are the machines we use in them. In some cases, the energy used per worker by computers, printers, copiers, scanners, and other equipment may exceed the energy used by lighting! Like lights, these machines need to be turned off at the end of regular hours. If staff needs to stay late, turn off the large copiers and select a smaller one for the less intense use. Adjust equipment to control temperature, speed or setting that uses less energy but still does the job properly. Ask for these features when purchasing replacement or new equipment and look for the Energy Star label. A list of Energy Star products can be found at [www.energystar.gov](http://www.energystar.gov).

Will this really make a difference?

By reducing the "on" time from 24 hours per day, 7 days a week to 9 hours a day, 5 days a week, you have reduced the consumption by 60%! Now consider the amount of computers in classrooms, computer labs, resource rooms, and offices. The results may surprise you!

## Hot Water

Poor efficiency with hot water will waste both energy and water. It always pays to fix leaks promptly. Turn off hot water taps when not needed. You can also consider timers to control operation of the water heater-reducing energy use on weekends or over school breaks. Hot water may be used in your school solely for showers or washing hands in lavatories, or it may also be used for laundry or dishwashing. If the former, the temperature setting for hand washing and showers doesn't need to be more than 120° F, yet often water heaters are set at a much higher temperature.

## Kitchen

There is a lot going on in the kitchen. With a sharp energy eye, you will find a lot of opportunities to reduce waste. SERT recommends working closely with the Food Services staff to ensure that health and safety regulations are not compromised.

Energy savings can be achieved by keeping the "on" times as close as possible to the actual use. Here are some examples:

- **Pre-heat ovens no longer than 15 minutes.**

Electric ovens consume a lot of energy so they should be controlled as close as possible to actual cooking time. All ovens should reach working temperature within 15 minutes. If the ovens require significantly longer pre-heats, contact the maintenance depot for repairs.



- **Use the hood fan only when ovens are on.**

The kitchen hood fans are used to remove the fumes from cooking. This is an important safety factor. Operating the hood fan while the ovens are not in use is expensive because the hood fan draws large volumes of conditioned air (room air that has been air conditioned or heated) and exhausts it outside. Allowing these fans to operate uncontrolled will drive your utility costs through the roof!

- **Only use lights that are needed, when they are needed.**

While the food is being prepared or when the kitchen is being cleaned, try to delay turning on the lights over the serving line until the lunch period begins.

- **Delay turning on appliances such as warmers, mixers, etc., until they are actually needed.**

- **Keep refrigerator coils clean and free of obstructions.**

- **Use thermometers in refrigerators and freezers to control actual temperatures.**



- **Consolidate food (perishables) in one walk-in unit and turn off free standing units.**

When closing down kitchen for long breaks and end of school year, all items should be removed from the free standing refrigerators and placed in walk-in units when possible. Free standing units should be cleaned out, turned off, and unplugged. **In the event of power failure, food left in smaller units may spoil and go unnoticed after power is regained. Remember, food that is thawed and then refrozen/refrigerated is a safety and health hazard.**

## Building Service Staff

The success of the SERT program depends on the coordination of three groups: the administration/staff, students, and the building service staff. The building service staff plays a very important part in SERT because faculty and the students do not have the access and the technical ability to effectively deal with building issues. SERT is an area where the building service workers can take pride and achieve recognition for their extra efforts. There are many things demanding the attention of the building service workers. To get them all done in a day often seems impossible. If certain things don't get done, maintenance problems start to multiply and get bigger. It is important to take time to ensure that maintenance items are completed. Use this list as a maintenance reminder to earn your SERT cash award.

### **Building Services Checklist**

For school breaks and long weekends, please refer to the School Energy Shut Down Checklist (See appendix).

During regular school operation, the following maintenance items will support your SERT Teams conservation efforts throughout the year.

- Keep lights off in large common areas (gym, multipurpose room, auditorium, etc.) when not needed in empty classrooms, and in unoccupied spaces such as storerooms, crawl spaces, etc.
- Reduce corridor lighting in over illuminated areas and turn off lights during unoccupied periods.
- Check thermostat set points: 70°F heating, 76°F cooling.
- Reduce hot water temperature to 120°F.
- Close all windows and outside doors when cooling or heating systems are in operation to control air infiltration.
- Keep corridor and classroom doors closed when HVAC is provided.
- Check Energy Management System (EMS) schedules for accuracy.
- Air conditioning and Heating is a big electricity consumer. Consolidate necessary MCPS evening activities into the minimum number of zones possible.
- Utilize student SERT patrols to check for unused appliances left on, especially before the weekend, holidays and for the summer.
- Establish a regular inspection and cleaning schedule for lamps and fixtures. Dust build up reduces efficiency and light outputs decrease significantly with age.
- Report repair needs of energy wasting equipment and follow up until repairs are made
- Report any malfunctioning equipments and schedule repairs.
- Replace filters of all equipment at recommended intervals and maintain documentation per your building maintenance plan.
- Inspect ventilation equipment for obstructions and dirt. Post signs if needed.
- Replace lenses that are cracked or yellowed with new acrylic lenses or relocate if needed.
- Clean surfaces to increase reflectivity and repaint or recover with high reflectance.
- Replace ballasts and lamps with more efficient, lower wattage, energy conserving wherever possible.
- Where fixtures have been de-lamped make sure ballast has also been disconnected.
- Install timers for vending machines and refrigerated drinking fountains.
- Track energy use by logging meter readings to establish benchmarks and measure success.
- Replace exit sign light bulbs with LEDs (low emitting diode).



## Water Conservation

- Increase employee, faculty, and student awareness of water conservation.
- Conduct contests for employees and students (e.g., posters, slogans or conservation ideas).
- Seek employee suggestions on water conservation; locate suggestion boxes in prominent areas.
- Install signs in all restrooms encouraging water conservation.
- When cleaning with water is necessary, use budgeted amounts.
- Read water meter weekly to monitor success of water conservation efforts.
- Assign an employee to monitor water use and waste.
- Determine the quantity and purpose of water being used.
- Determine other creative methods of water conservation.

### On School Grounds

#### Conservation Procedures Applicable to All MCPS Facilities

- Be alert for water leaks and water main breaks. Report continuous water flow and ponding of water to maintenance immediately. Repair leaking faucets.
- Do not use school water supplies or the school grounds to wash automobiles, buses, and trucks.
- Do not allow local residents, road maintenance tankers or other non-MCPS agencies to use school water supplies, school hose bibs, or to control irrigation.
- Water should not be used for landscape and grass except by contractors during initial establishment of trees and plants.
- Mulch around plants reducing evaporation and discouraging weeds. Apply mulch annually. Use mulching mowers. Leave mulch on grass to fertilize and reduce moisture loss.
- Remove weeds and unhealthy plants so remaining plants can benefit from the water saved.
- For small grass areas use a manual push-reel mower or electric model. Using a gasoline mower to cut a small lawn emits as much pollution as driving a car on the freeway for an hour.
- Increase mowing height to 2-3 inches and apply mulch to reduce evaporation and prevent weed growth.
- Use a broom rather than a hose to clean decks, sidewalks, and other paved areas: 5 minutes of running the hose uses 25 gallons of water.
- Collect rainwater for reuse in the garden whenever possible.
- Use native drought-resistant species of plants when replanting. Experts can help.

#### Irrigation Procedures Applicable to High School Athletic Fields Only

- **Water athletic fields when the ground is dry and preferably no more than two or three times a week:** The amount of water used by one sprinkler in one hour is equal to the daily water needs of a family of four. You can use an empty tuna can to measure if you had 1" of rain per week, which is the amount of water grass needs during the growing season (mid April to End of September). If you can poke the wrong end of a pencil in the ground for about 2", the topsoil moisture is ok.
- **Water athletic fields during the coolest part of the day (preferably morning or late evening) and never water on windy days:** As much as 30% of water used can be lost to evaporation by watering lawn during midday.



- **Make sure irrigation equipment applies water uniformly.** Investigate the advantages of installing drip irrigation systems. Install soil moisture overrides or more sophisticated weather sensitive controls on irrigation systems.
- **Ensure that automated irrigation systems turn off when it rains.** Installation of rain switches is highly recommended to avoid this problem.
- **Avoid runoff** and make sure sprinklers cover just the lawn or garden, not sidewalks, driveways, or gutters.
- **Avoid excess watering.** Excessive watering promotes fungal growth and prevents the development of long, deep root systems needed for healthy turf.

## Landscape Design

- Limit grass areas and use trees, shrubs, and other plants that require less water to landscape your yard: Grass turf requires 30-50% more water than shrubs and other groundcover. Landscape with drought resistant plants.
- Use water-saving landscape and irrigation systems.
- Use captured rainwater/recycled water.
- Efficiently design playfields to reduce irrigation needs.

## In the School Building

- Install low-flow toilets, waterless urinals, shower heads, faucets and faucet aerators.
- Educate students, faculty, and administrative staff on the why and how of conserving water.



## In Operations / Maintenance Policies and Practices

- Regularly check water meters, even during no occupancy months.
- Establish water use baseline and monitor and report consumption statistics.
- Establish method to regularly check building for water leaks and report to maintenance staff for repair.
- Turn off any unnecessary flows.
- Repair dripping faucets, showers, and continuously running or leaking toilets.
- Install flow reducers and faucet aerators in all plumbing fixtures whenever possible.
- Reduce the water used in toilet flushing by either adjusting the vacuum flush mechanism or installing toilet tank displacement devices (dams, bottles or bags).
- As appliances or fixtures wear out, replace them with Energy Star models that use less water and power.
- Shut off water supply to equipment rooms not in use.
- Minimize the water used in cooling equipment, such as air compressors, in accordance with the manufacturer recommendations.
- Reduce the load on air conditioning units by shutting air conditioning off when and where it is not needed if you are not controlled by EMS.
- Keep hot water pipes insulated.
- Avoid excessive boiler and air conditioner blow down. Monitor total dissolved solids levels and blow down only when needed.
- Instruct clean-up crew to use less water for mopping.

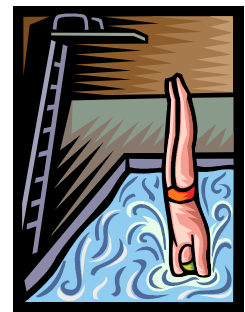


## Kitchen and Laundry Areas

- Turn off the continuous flow used to clean the drain trays of the coffee/milk/soda beverage island; clean the trays only as needed.
- Turn dishwasher off when not in use. Wash full loads only.
- Replace spray heads to reduce water flow.
- Recycle rinse water from the dishwasher or re-circulate it to the garbage disposal.
- Do not use running water to melt ice or frozen foods. If necessary, use ponded water.
- Use water-conserving ice makers.
- Presoak utensils and dishes in ponded water instead of using running water rinse.
- Wash vegetables in ponded water; do not let water run in preparation sink.
- Use water from steam tables in place of fresh water to wash down the cooking area.
- Reprogram machines to eliminate a rinse or suds cycle, if possible, and if not restricted by health regulations.
- Only wash full loads of clothes.
- Evaluate wash formula and machine cycles for water use efficiency.

## Pools

- Channel splashed-out pool water into landscaping.
- Lower pool water to reduce amount of water splashed out.
- Reduce amount of water used to clean pool filters.
- Cover pools to prevent evaporation: An average uncovered pool loses about an inch of water a week because of evaporation



## Water Auditing

The MD Department of the Environment offers three forms for a water audit in facilities and at home, together with spreadsheets to fill in. This analysis is helpful to determine the status quo and at the same time identify potential savings.

You can download these files:

- Conducting a State Facility Water Audit
- Conducting a Drinking Water Distribution System Water Audit
- Conducting a Household Water Audit

at [www.mde.state.md.us/Programs/WaterPrograms/Water\\_Conservation/Water\\_Auditing/index.asp](http://www.mde.state.md.us/Programs/WaterPrograms/Water_Conservation/Water_Auditing/index.asp)

## Links and Resources for Water Conservation

- Earth Science Week [www.earthsciweek.org](http://www.earthsciweek.org)
- EPA Water Conservation [www.epa.gov/water/water\\_efficiency.html](http://www.epa.gov/water/water_efficiency.html)
- The Groundwater Foundation <http://www.groundwater.org/kc/kc.html>
- Maryland Department of Natural Resources-Project WET  
[www.dnr.state.md.us/education/teachers.html](http://www.dnr.state.md.us/education/teachers.html)
- National Geographic [www.nationalgeographic.com/gaw/frwater](http://www.nationalgeographic.com/gaw/frwater)
- Project Wet Water Education for Teachers [www.projectwet.org](http://www.projectwet.org)
- U.S. Geological Service Water Science for Schools <http://ga.water.usgs.gov/edu/>
- Water Environment Federation <http://www.wef.org/Education/Connection/index.jhtml>
- Water on the Web <http://waterontheweb.org/>
- WaterShare, U.S. Department of the Interior, Bureau of Reclamation  
[http://www.usbr.gov/gp/water/wc\\_index.cfm](http://www.usbr.gov/gp/water/wc_index.cfm)

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Department of Facilities Management  
Gaither Road . Suite 203 . Rockville, MD 20850  
Telephone 240 . 314. 1095 Fax 240 . 314. 1036  
[www.Schools2Green.org](http://www.Schools2Green.org)

## Car Pooling Policy and Guidelines for Great Seneca Creek ES

### **A. PURPOSE**

To ensure that Great Seneca Creek ES pursues carpooling as an alternative method of transportation due to its direct and indirect relation to the current policies aimed at preserving our natural resources. Carpooling is a strategy which positively affects the design and environmental impact of parking as an integral part of site development.

### **B. ISSUE**

The growing need to offer viable transportation alternatives is paramount to reducing the impact of vehicle emissions on air quality and the daily occurrence of traffic congestion on the interstate, county highways, city streets and rural roads. Montgomery County Public Schools is committed to building more efficient and sustainable facilities which lead to healthier learning environments.

### **C. POSITION**

Great Seneca Creek shall proactively work to develop and implement policies that meet its primary goal of providing the best educational experience for its students, staff and faculty. With MCPS policies currently in place for energy and water conservation as well as recycling, carpooling offers the next opportunity for schools to support more environmentally and economically sustainable practices that enhance the system-wide plan for resource conservation.

MCPS promotes carpooling on a voluntary basis. By participating in a carpool group, faculty, staff and students help reduce the amount of parking spaces needed at MCPS schools and facilities lowering construction costs, reduce CO2 emissions improving air quality and improve the overall physical health and mental well being.

### **D. DESIRED OUTCOME**

Establish carpooling as the alternative approach to single car occupants in order to promote a healthier environment and reduced stress levels among staff and students improving performance of all building occupants. To influence environmentally and economically sustainable practices through the design of new and existing facilities, which result in lower construction and maintenance costs.



## POLICY OUTLINE

### 1. Definition of Carpooling

Carpooling is different from ridesharing. A rideshare is a personal arrangement to be driven regularly and not a formal commitment to share commuting responsibilities. Carpooling involves a mutual and reciprocal exchange of time and resources. Each member should drive and purchase gas. A carpool schedule should be agreed upon prior to committing to the carpool group.

The proposed policy defines carpooling as a group of two or more people:

- a) Who travel to a “common destination” (e.g. and MCPS school, office or facility) at least 3 days per week,
- b) Who make a formal written agreement to participate in the carpool for a minimum of 3 months,
- c) Whose members have registered with main office,
- d) Each of whom is of legal driving age and has at least one vehicle registered to the carpool permit,
- e) Who do not take a break from the carpooling group for any longer than 4 consecutive weeks and no more than twice during a school year (July 1 – June 30),
- f) Whose participants do not currently hold another parking permit at the carpool destination, and
- g) Who must travel together for the majority of their trip distance.

### 2. Registration

To be considered a part of a carpool, all members must first complete a Registration and Parking Application Form, including a Carpool Commitment Agreement signed by all members.

- a) Registration and Parking Application requires members to provide the following documentation prior to issuing a Green Great Seneca Creek parking permit tag:
  - Driver's License
  - Verification of current home address. Acceptable forms of proof include: current utility bill, lease, or payroll stub
  - License Plate # (for all cars that will be used in the carpool)
  - Student ID / Employee ID
  - Carpool Commitment Agreement signed by all members
- b) The Carpool Commitment Agreement states:
  - Every member of the carpool must contribute driving time and gas expenses.
  - Members that wish to participate in the carpool but do not have a vehicle must contribute at twice their share in gas based on the agreement made among the carpool members.

### 3. Carpool Fees

No fees are required to join a carpool group.

### 4. Carpool Permits

Carpool Members that are issued a carpool permit must use them according to the following Rules and Regulations:

- a) One carpool parking permit will be issued to each carpool member
- b) Only one carpool permit per group may be used at the designated location
- c) Carpool permits may not be shared or given to anyone not registered for carpooling
- d) Carpool permits must be renewed each year



## **5. Carpool Spaces**

- a) There are two designated parking spaces assigned for carpoolers at Great Seneca Creek ES close to the loading dock and entrance on the Northwest Side of the building. These are available on a first come first serve basis for cars that are registered as a carpool participant with the main office. Cars must display a Green Great Seneca Creek parking permit tag in the front window while parking.
- b) If less than two carpools are registered for the school the parking spaces are made available to low-emitting and fuel-efficient vehicles, either defined as Zero Emission Vehicle (ZEV) by the CA Air Resources Board, or with a minimum green score of 40 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide. These cars must also display a Green Great Seneca Creek parking permit tag in the front window while parked.

## **7. Withdrawal from a Carpool**

- a) As stated in the section, "Definition of a Carpool", carpoolers must make a minimum three-month commitment to participate in the carpool program. If circumstances require the carpooler to withdraw prior to that period, all permits must be returned to the main office. A confirmation of withdrawal will be sent to the carpooler.
- b) In order to rejoin another carpool group after withdrawal, he or she must fulfill the following requirements:
  - Wait a full three-month period following the withdrawal before joining again and
  - Complete a new Registration and Parking Application.

## **8. Dissolving a Carpool**

A carpool is considered dissolved when sufficient members of the carpool are no longer interested in carpooling or are no longer eligible to belong to the carpool. In this case, official notice along with all permits must be returned to the main office.

- a) If a carpool dissolves once during the school year, it must wait a full three-month period after it dissolves before it can be considered for carpooling. Also, no more than 2 people from the previous carpool can join again as part of the new carpool group.
- b) A carpool that dissolves and has one member wishing to continue in the program, a five-day grace period will be given in order for him or her to find others to join. After that, all rights and privileges will be revoked. The permits must be returned promptly.

## **9. Enforcement of Regulations**

- a) Violations, fines and/or penalties shall be issued to carpoolers if not in compliance with the Rules and Regulations stated.
- b) Vehicles not registered to be in a carpool will be tagged and a warning will be given if parked in a carpool space.
- c) Unauthorized use of carpool parking permits will result in suspension or revocation of carpool parking privileges.
- d) All Violations will be reported to the school Principal.



## Great Seneca Creek ES Car Pooling Application and Registration

Date of Application:

First Date of Carpooling:

Last Date of Carpooling:

Number of Participants:

Name of Members:

Name of Member 1:

Home Address:

Employee ID Number:

Distance from School:

Phone Number:

License Plate # :

Type of Car:

Color:

License Tag:

Scheduled Days:





## Great Seneca Creek ES – Carpooling Agreement

(to be signed by all members)

Date of Application:

First Date of Carpooling:

Last Date of Carpooling:

Number of Participants:

Name of Members:

Pick up and Drop off Locations:

Miles traveled:

Schedule:

Mo

Tue

Wed

Th

Fr

Sat

Reimbursements (if any):

Insurance Disclaimer to be worked out by members. Please check with your insurance provider.

Signature:

Signature:

Signature:

Date:

Date:

Date:



[www.Schools2Green.org](http://www.Schools2Green.org)

## Great Seneca Creek ES – GREEN PARKING PERMIT TAG



This Permit allows the car with the License Tag  
#: \_\_\_\_\_

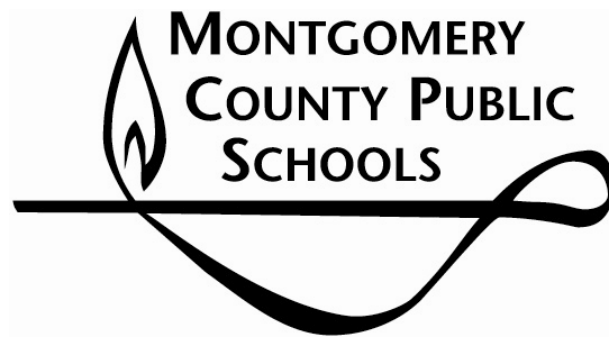
to park in the parking space designated for  
Carpooling on Great Seneca Creek ES MCPS  
property until \_\_\_\_/\_\_\_\_/\_\_\_\_.

# **Great Seneca Creek Elementary School – Green Book**

## **6. High Performance Green Cleaning**

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# Healthy, High Performance Cleaning Program



Division of School Plant Operations

September 2006

# *Montgomery County Public Schools*

## **Healthy, High Performance Cleaning Program (Green Cleaning)**

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10. 11 <sup>TH</sup> REPORT ON CARCINOGENS PUBLISHED BY THE NATIONAL TOXICITY PROGRAM	

## Section I – Summary

This plan serves two primary functions. First, the plan informs facility managers and educates the building service staff on how to achieve “green housekeeping” requirements. Second, the plan serves as the US Green Building Council (USGBC) LEED™ submittal to demonstrate the intent for a “green cleaning & housekeeping” innovation credit has been met for this Project.

The USGBC has stated the intent for a “green cleaning/housekeeping” innovation credit as *“Reduce exposure of building occupants and maintenance personnel to potentially hazardous chemical contaminants that adversely impact air quality, occupant well being, and the environment.”* The project team must demonstrate that a “comprehensive green cleaning/housekeeping program is in place with clear performance goals” in order to receive this innovation credit. To show that these requirements are met, the USGBC requests, and this plan provides, the following:

- A. A statement of purpose describing what the policy is trying to achieve from a health and environmental standpoint, focusing on cleaning chemicals and custodial training at a minimum.
- B. A contractual or procedural requirement for operations staff to comply with the guidelines, including a written program for training and implementation.
- C. A clear set of acceptable performance level standards by which to measure progress or achievement, such as Green Seal Standard GS-37 or California Code of Regulations, Title 17 Section 94509 “VOC Standards for Cleaning Products”.
- D. Documentation of the program’s housekeeping policies and environmental cleaning solution specifications, including a list of approved and prohibited chemicals and practices. Demonstrate that the products used in the project are non-hazardous, have a low environmental impact, and meet the criteria set forth in #3 above. Concentrated cleaning products should be utilized when available.
- E. Select six major cleaning needs and identify products (compliant with #3 above) that will be supplied to meet these needs. Note that one cleaner may address several cleaning functions. Examples of cleaning needs include, but are not limited to: counter, sink, shower, tile, limescale remover, toilet, hard flooring, laundry detergent, laundry bleach and windows.

## Section II – Statement of Purpose

This plan and its requirements is a commitment to purchase and use cleaning and grounds care products and methods that reduce adverse impacts on public health and the environment. Cleaning methods set forth herein emphasize the removal of indoor pollutants (including soils, particulates, microbes, etc.) while maintaining a safe and healthy environment for all students, workers and other building occupants. Additionally, methods minimize the amount of product used as well as the amount of waste that is created. Products that fall under this plan include general purpose, restroom, glass, and carpet cleaners, disinfectants, floor care products, hand soaps, paper supplies for cleaning, and paper supplies for restrooms. The product recommendations included in this plan are meant to provide current examples of acceptable cleaning products; however, substitute products may be used, provided they meet the criteria set forth in this plan.

There are two primary benefits to “green” interior sanitation methods. First, selecting products that do not contain environmental contaminants reduces the ecological impact of cleaning products that end up down the drain. Second, cleaning practices that take environmental principles into account improve indoor air quality for building



occupants and cleaning staff. The result is a decrease in building-related illness, greater productivity, and reduced liability for the school system. Green housekeeping is shown to reduce suspended particles, volatile organic compounds, as well as bacteria and fungi. (*Indoor Environment Characterization of a Non-Problem Building: Assessment of Cleaning Effectiveness* prepared for the US EPA Environmental Criteria and Assessment Office by Research Triangle Institute, 1994.)

The HHPC program also includes operational standards to ensure effective equipment performance, and energy conservation. Training, involvement and close collaboration with students, staff and the community is also a key component of the program promoting environmental principles beyond the school walls.

### **Introduction**

Montgomery County Public Schools, Division of School Plant Operations (DSPO) is committed to providing a healthy facility environment that is conducive to student learning, and employee productivity. The DSPO also recognizes its social responsibility to protect natural resources for future generations. As a result of this commitment to students, staff and the environment, the DSPO has developed this Healthy, High Performance Cleaning (HHPC) program.

The DSPO HHPC approach consists of six essential components; products, equipment, processes, certification, audit and collaboration. It includes use of chemicals and equipment that have been certified as environmentally preferable by independent organizations such as Green Seal and the Carpet and Rug Institute. Documented best practices for accomplishing tasks i.e. Systematic Team Cleaning, Integrated Pest Management and the School Eco Response Team will also be used. The DSPO places high strategic value on maintaining sustainable operations and therefore will continue to monitor buildings for adherence to LEED for Existing Buildings criteria by performing regular quality assurance inspections. This program will be fully implemented when students, staff and the community at all schools recognize, understand, and celebrate it and begin to pass on these concepts beyond MCPS.

### **Guiding Principles**

1. ***Every day, every student has the right to a healthy and safe school environment.*** Every adult is accountable and personally responsible for protecting the health and safety of students. Every adult is expected to work collaboratively to sustain a healthy and safe environment by:
  - a. Recognizing the factors that contribute to an unhealthy environment
  - b. Knowing how what they do contribute to the environment (we must all be responsible for our impact on the environment)
  - c. Taking corrective actions and/or notifying appropriate staff necessary to restore the environment to healthy conditions
2. The DSPO will provide training and communicate with staff and community users to educate them on the value of HHPC on the health and academic performance of students as well as the personal and environmental benefits of a successful program.
3. ***Every employee has the right to work in a healthy and safe environment.*** Workplace conditions are regularly evaluated to minimize worker/occupant exposure to harmful contaminants and cleaning residues. Systemic processes are in place to assure compliance with OSHA standards, safe operating procedures, and use of safe tools, equipment and supplies. Proper procedures, potential hazards and safety information are documented, clearly communicated to workers and readily available for review.
4. ***What gets measured gets done.*** The DSPO uses an automated inspection tool, to evaluate and manage school facilities for key environmental, safety and health issues. This tool is used to monitor and verify that HHPC standards are

being maintained. Regular assessments of school facilities are performed to track and manage information on environmental conditions. Information from these assessments is used to ensure consistent application of the standards throughout the school and drive improvement.

5. ***Effective cleaning that ensures consistent, thorough cleaning is achieved by applying systematic approaches to work planning and work flow considering the entire school campus and programs; including building, grounds and activities.*** The DSPO staff use systematic work plans and custodial and grounds equipment that minimize student exposure to noise, dust, cleaning residues and exhaust fumes. Specialized duties are assigned to each staff member so that the amount of time necessary to accomplish tasks is minimal, the quality of cleaning is consistent throughout the building and the potential for occupant exposure to adverse affects is limited.
6. ***Effective management of the exterior environment is essential to ensure healthy conditions are sustained in the interior environment.*** Minimize pollutants entering the building, while maximizing the amount of pollutants extracted.
7. **Healthy, High Performance Cleaning can be accomplished while the amount of chemicals used and moisture accumulated and/or released into the air is limited.**
8. **Emergency response plans ensure rapid restoration of areas affected by unsuspected incidents such as floods, spills, blood, etc.**
9. **Disposal of cleaning waste in environmentally safe ways preserve and protect the local ecology.**
10. **Regularly scheduled preventative maintenance on HVAC systems ensures healthy, indoor air quality, climate control and longevity of equipment.** The DSPO uses comprehensive building maintenance plans, employee training and quality assurance inspections to effectively operate and maintain mechanical systems.
11. **Together, we can make a difference.** Training, involvement of and close collaboration with students, staff and the community ensures sustainability of the HHPC Program.

Section C below, Requirements and Product Recommendations, provides the details on how to implement this plan. Requirements for cleaning practices, including how cleaning products are to be stored, specific methods for cleaning (what is required and what is not allowed), a cleaning frequency schedule, custodial equipment operational standards and requirements for disposal and recycling are identified. Referenced standards that must be met when purchasing cleaning products, including a list of prohibited ingredients are provided. This also includes specific product recommendations that meet the required standards. Requirements for grounds care and mechanical systems operations are also identified. Finally, are the requirements for staff training. Section D provides additional resources, including product manufacturers, and Section E is a glossary of terms used in this plan.

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## Section III – Requirements & Product Recommendations

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### **A. Cleaning Practice Requirements**

The HHPC objectives for maintaining the interior of schools are to maximize the amount of pollutants extracted, minimize worker/occupant exposure to harmful contaminants and cleaning residues, minimize the amount of chemicals, particles, and moisture accumulated and/or released into the air by the cleaning process, and dispose of cleaning waste in an environmentally responsible manner.

To ensure that these objectives are accomplished, the DSPO utilizes a Systematic Team Cleaning (STC) approach that maximizes the quality, quantity and consistency of building services. STC also reduces error and equipment and energy costs. This approach systematizes the application of personnel, tasks, frequency, time and space to get the most out of the cleaning process. Additionally, quality assurance inspections are performed daily by onsite staff and as scheduled by offsite supervisors.

#### **1. Storage Requirements for Cleaning Products**

- a. Containers will be securely closed when not in use
- b. Storage areas that contain cleaning products will be fully ventilated
- c. Custodial closets and storage areas will be kept clean and free of standing water
- d. Used cloths and wet mops will be rinsed after each use; hang up to dry (do not leave wet items in sinks or buckets)
- e. Dispensing equipment that minimizes worker exposure will be used

#### **2. Cleaning Procedures**

- a. *Reducing chemical use* - The goal is to minimize occupant and worker exposure to aggravating or harmful chemicals released into the indoor environment during cleaning processes. Particular attention is given to floor maintenance procedures that minimize or eliminate chemical use.
  - i. Apply durable floor finishes; deep-scrub with floor cleaner and re-coat finish as necessary (avoid the use of floor strippers)
  - ii. Scrub floors regularly to remove dirt and embedded marks in floor finishes (to reduce the need for stripping); perform floor scrubbing when students and other occupants are not present in the immediate area
  - iii. Ensure cleaning schedule meets actual needs to avoid redundant cleaning
  - iv. Use microfiber mops and cloths that do not require application of chemicals, and which reduce the use of disposable paper towels
  - v. Spot clean with scouring pad first; use cleaning solution only as required
  - vi. Use a solution of 4 oz. vinegar to 4 gallons cold water for rinsing

#### *b. Product dilution*

- i. Dilute all concentrated cleaning chemicals per manufacturer recommendations for each application
- ii. Use lowest concentration possible for each application

*c. Reducing dust and dirt*

Effective dusting, dust mopping, and vacuuming thoroughly captures dust particles and prevents them from circulating into the air, moving to other surfaces, or being draw into ventilation equipment.

- i. Provide roll-up mats at each outside door; vacuum and spot clean roll-up entryway mats daily and use carpet extractor with wand attachment weekly – *proper and frequent entryway cleaning reduces outdoor contaminants from being spread throughout the building, which extends the longevity of the flooring systems and reduces the need for floor maintenance tasks (such as stripping and applying additional coats of floor finish)*
- ii. Provide roll-up mats at each outside door; vacuum and spot clean roll-up entryway mats daily and use carpet extractor with wand attachment weekly – *proper and frequent entryway cleaning reduces outdoor contaminants from being spread throughout the building, which extends the longevity of the flooring systems and reduces the need for floor maintenance tasks (such as stripping and applying additional coats of floor finish)*
- iii. Replace mats when there is visible surface wear
- iv. Vacuum or damp-mop instead of sweeping
- v. Use vacuum cleaners that meet the standards for CRI Green Label
- vi. Change vacuum bags when they are 3/4 full; check bags prior to each use
- vii. Use a damp cloth or microfiber cloth to remove dust
- viii. Use burnishers or high-speed buffing machines that are equipped with vacuum attachments and dust prevention skirts.

*d. Reducing microbial growth*

- i. Wet-cleaning equipment for carpets should have high-quality extractors that leave carpeting dry to prevent microbial growth
- ii. Apply disinfectants where/when required; allow 3-5 minutes for disinfectant to take effect prior to cleaning.
- iii. Use all purpose cleansers instead of bleach to remove microbes
- iv. Change microfiber mops and cloths on a regular basis; at a minimum, replace mop heads and cloths daily, wash and rinse thoroughly after each use, or when they smell or show visible dirt, even when rinsed thoroughly

- v. Ensure that mops are allowed to dry completely between uses; mops should be hung in janitorial closet on hooks provided, *not* stored in buckets or slop sink
- vi. Clean areas where water collects or condenses

*e. Restroom cleaning*

Effective restroom cleaning procedures remove harmful germs and bacteria that may be present on door handles, fixtures, walls, floor and floor drains, and other surfaces. All of these must be cleaned and disinfected regularly to prevent the spread of contagious illnesses. Since restrooms are heavily used, there must be a schedule to ensure that they are refreshed frequently. Refresher schedules shall include restocking of hand soap, toilet paper, and paper towels, as well as spot cleaning where required.

- i. Clean daily all: floors, counter tops, basins, toilet partitions, toilets, urinals, light switches, mirrors, door knobs, and showers
- ii. Disinfect floors, counter tops, basins, toilets, urinals, and showers daily (after cleaning)
- iii. Ensure floor drains are operating properly

*f. Food preparation and eating areas*

- i. Clean daily all: floors, counter tops, basins, appliances/equipment, light switches, and door knobs
- ii. Disinfect floors, counter tops, and basins daily (after cleaning)
- iii. Clean all surfaces that come in contact with food preparation after each meal or use; keep free of food scraps and debris
- iv. Clean all washing areas and appliances, including cooking and eating utensils, after each meal or use
- v. Clean tables and chairs (top and underside) after each meal or use; disinfect after cleaning
- vi. Keep floors clean, free of food scraps, debris and any signs of bio-contamination; clean at least once daily
- vii. Ensure floor drains are operating properly and odor-free; flush clogged drains with hot water to remove clog
- viii. Trash receptacles are to be tightly covered and emptied at least once daily (or when full); do not allow trash to overflow
- ix. Inspect all food preparation and eating areas for evidence of insects, rodents, or bio-contamination (such as mold)

*g. Prohibited Practices*

Do not mix products that contain chlorine (or chlorinated compounds) with those that contain ammonia

*h. Cleaning Frequency Schedule and Checklist*

Checklists, such as the one shown in Section F, shall be used in training cleaning staff and as a task checklist on cleaning carts.

*i. Disposal Requirements*

*i. Excess product*

1. Use all cleaning products until containers are completely empty
2. Use products with expiration dates prior to expiration
3. Dispose of all excess product in accordance with manufacturer instructions

*ii. Packaging*

1. Recyclable packaging includes, at a minimum, white office paper, mixed paper, press board, corrugated cardboard, plastics #1 (PET) and #2 (HDPE), metal, and glass
2. Recycle all packaging in designated recycling area

**B. Grounds Care Requirements**

The HHPC objectives for maintaining grounds are to remove hazards (such as broken glass and other trash), prevent outside pollutants from entering the school, minimize the amount of pollutants released into the air and grounds, and minimize the noise.

**1. Reducing Chemical Use**

An integrated pest management policy (MCPS ECF-RA) promotes the use of alternatives to chemical pesticides; when non-chemical methods are not available or prove ineffective, use nontoxic or least toxic pesticide options. School inspections are performed and notifications issued to ensure that staff and school related organizations (i.e. PTA) act in accordance with these regulations.

- a. Eliminate the use of herbicides (weeds may be removed by hand)
- b. Snow removal and deicing
  - i. Snow shall be removed by physical means; do not use deicing chemicals to remove snow; remove snow using equipment such as plows, shovels, or snow-blowers
  - ii. Do not over-apply de-icers; remove ice physically when possible and apply only the amount of product that is needed to melt ice
  - iii. Avoid the use of chloride salts for de-icing (harmful to vegetation, corrode steel, and can cause scaling, cracking, and spalling in concrete) in favor of vegetable-based, agricultural byproduct de-icers

**2. Reduction of Airborne Particulates and Fumes**

- a. Do not use a blower to remove normal to average accumulation of dust and debris near building entrances. Instead, sweep or hose down.
- b. Do not use a mechanical mower on areas where ground cover is shorter than 1 inch or where dirt is exposed
- c. Use battery powered equipment
- d. Grounds waste should be left in designated areas for pick up

## **C. Product Standards**

### **1. Referenced Standards**

- a. All cleaning products must meet the requirements in the following third-party standards:
  - i. Green Seal standards for “Industrial & Institutional Cleaners” (GS-37)
  - ii. Green Seal standards for “Tissue Paper” (GS-01)
  - iii. Green Seal standards for “Paper Towels and Paper Napkins” (GS-09)
- b. Consider “green housekeeping” certification from Green Seal through its “Green Facilities Operation and Maintenance Criteria” (GS-39)
- c. All exterior pest management products must meet the requirements of MCPS Policy ECF-RB, “Integrated Pest Management Program”
- d. Consider using products that meet the requirements of Green Seal standards for “Cleaning/Degreasing Agents” (GS-34)

### **2. List of Prohibited Cleaning Chemicals**

The chemicals found in cleaning products include toxins, such as known human carcinogens, narcotics, neurotoxins, terratogens, and mutagens. The EPA has catalogued complaints directly associated with cleaning product, the most common of which include: eye and respiratory irritation, headaches and chronic fatigue, dizziness and heart irregularities, impaired judgment and coordination, irritability and mood swings, nausea, and joint and muscle pain. Many of these chemicals are unnecessary additives.

- a. All cleaning products will be free from the following chemicals.
  - i. Alkyl phenol ethoxylates – *class of detergents linked to endocrine disruption and with high aquatic toxicity*
  - ii. Benzene – *volatile organic compound used as a solvent and a known carcinogen*
  - iii. Optical brighteners
  - iv. Ozone-depleting compounds (ODCs) – *see Section E, Definitions*
  - v. Phthalates and dibutyl phthalate – *family of chemicals frequently used as a plasticiser; probable carcinogen and known to cause chronic health effects including liver and kidney abnormalities*
  - vi. Heavy metals, including arsenic, lead, cadmium, cobalt, chromium, mercury – *heavy metals bio-accumulate in the environment and in people, and linked to many health issues, including neurological disorders, kidney problems, high blood pressure, birth defects, and genetic mutation*
- b. All cleaning products will be free from chemicals listed in the 11th Report on Carcinogens published by the National Toxicology Program
- c. Minimize the use of the following cleaning chemicals or products containing them:
  - i. Ammonia and quaternary ammonium compounds – *effective disinfectant and stain remover that is linked to asthma and skin sensitization*
  - ii. Chlorine and chlorinated compounds, including bleach – *a disinfectant, not a cleaner, that is highly corrosive, is a severe eye and respiratory system irritant that is often contaminated with mercury (a potent neurotoxin)*

- iii. Phosphates – *over nutrify waterways and can cause algae blooms*
- iv. Monoethanolamine – *typically used as a medical disinfectant and linked to asthma*
- v. Chlorhexidine – *typically used as a medical disinfectant and linked to asthma*
- vi. Chloramine – *typically used as a medical disinfectant and linked to asthma*
- vii. Zinc and zinc compounds – *soluble forms are toxic to aquatic life*

### **3. Additional Product Selection Criteria**

- a. All products must be clearly labeled and prominently state dilution recommendations
- b. Avoid aerosol products
- c. Undiluted products must not contain ingredients that are toxic to humans (meet exposure limits set by NIOSH or OSHA)
- d. Undiluted products must not be corrosive to the skin or eyes
- e. Products must eliminate fragrances or show that any fragrances meet the Code of Practice of the International Fragrance Association
- f. Products must not be combustible (flashpoint above 150°F)
- g. Ingredients must not pollute waterways (directly or indirectly)
  - i. Ingredients must not contain total phosphorous (including compounds) that exceeds .5% by weight
  - ii. Ingredients must not be toxic to aquatic life
  - iii. Ingredients must exhibit ready biodegradability (removal of DOC by >70% or BOD by >60% according to ISO testing methods 9439, 10718, 10808, or 7827)
- h. Give preference to products with recyclable primary packaging
- i. Give preference to packaging made with post-consumer recycle content

Additional application-specific criteria are included in “*Product Recommendations*” below.

### **4. Product Documentation Requirements**

At least one of the following shall be on file to demonstrate that products meet or exceed the standards listed above:

Proof the products have been Green Seal certified

- a. Signed statement by a senior company official (vice president or higher) for the product manufacturer stating that the product will be certified by Green Seal within 90 days
- b. Certification by an independent third-party stating that the products have been tested in accordance with the Green seal standards and that the products meet or exceed those standards. Such certification must include a review of all test data required for a product to be certified by Green Seal



## **D. Product Recommendations**

Following are product *recommendations* for each cleaning application that meet the policies and standards defined above. The product recommendations included in this plan provide examples of acceptable cleaning products; however, substitute products may be used, provided they meet the criteria set forth in this plan. Prior to purchase and use, all products will be evaluated and approved by MCPS Environmental Services/Indoor Environmental Team. Product manufacturer will provide training in product appropriateness for each designated application and recommended dilution for all concentrate products. Product labels and instructions will be clear and visible for cleaning staff. Additional product requirements for specific applications are included below.

### **1. General Janitorial:**

**Alpha-PH Multi-Surface Cleaner (US EPA registered #70627-54)** will be used for disinfecting, cleaning, and deodorizing all areas including restrooms. It cleans glass, countertops, sinks, stainless steel, and chrome. When mixed with water at different dilution rates it is used as an all purpose surface cleaner for walls, student desks, light fixtures, window sills and door frames. Cleaner can also be used with warm water to scrub tile floors. It should be used with cold water to maintain floors.

### **2. Floor Care:**

- a. Alpha-HP Multi-Surface Cleaner- used to wet mop floors and can be used in scrub machine.
- b. Snapback Spray Buff- used with high speed buffing machines to restore and maintain the shine on tile floors.
- c. Maintainer Plus - Formulated for daily use and doesn't require burnishing after each application. Use through an auto scrubber or with mop and bucket.
- d. Carefree Floor Finish- used to seal tile floors after scrubbing or stripping procedure.
- e. Contender Gym Finish- used to seal wood floors after screening and tacking procedure.
- f. Tacking Solution- used for tacking wood floors after screening procedure.
- g. Bravo- stripper mixed with water to strip tile floors with wax build-up present.
- h. Vinegar- used with cold water to mop floors. Also can be used as a defoamer in carpet extractor machines.
- i. Carpet Care Supplies: Alpha-HP will be used in carpet extractor machines and to spot clean carpets.
- j. Gum Remover

### **3. Kitchen sanitizing:** The current products are used for sanitizing food service kitchens.

- a. Pink Suds - Lotionized pink liquid detergent for pots, pans and other utensils (Cavalier Chemical Co.)
- b. Emerald Green – super concentrated all purpose liquid cleaner (Cavalier Chemical Co.)
- c. Oven Cleaner & Degreaser (Cavalier Chemical Co.)

- d. Chlorine Bleach for sanitizing
  - e. Scale and Film Remover for removing lime scale deposits (Sanolite Corp.)
  - f. Germicidal Rinse/Sanitizer - for yogurt & smoothie machines (Sanolite Corp.)
  - g. Jester NF - Heavy duty liquid detergent for cleaning automatic hood systems (Sanolite Corp.)
4. **Restrooms** (*includes sinks, showers, floors, drains, waterless urinals, restocking, etc.*) See also "General Janitorial" products listed above.
- a. General Cleaning – Johnson Alpha HP
  - b. Disinfectants – disinfectants are not to be used in place of cleaning products; may not have VOCs that exceed 1% by weight of undiluted product and must be registered by the US EPA. **Alpha-PH Multi-Surface Cleaner (US EPA registered #70627-54)**
  - c. Hand Soaps – give preference to products that do not contain anti-microbial ingredients, such as triclosan and should have a pH between 6 and 8.5
5. **Kitchenettes, Food Service and Eating Areas**
- See also "General Janitorial" and "Restroom" products listed above.
- Dishwashing detergents – give preference to products that do not contain anti-microbial ingredients, such as triclosan
6. **Paper Products**
- a. Paper supplies for cleaning shall not be used. Reusable micro fiber cloths shall be used for cleaning
  - b. Paper supplies for restrooms: Toilet tissue shall contain a minimum of 35% recycled fibers. Paper towels shall contain 100% recycled fibers.
7. **Grounds Maintenance**
- De-icers – MCPS uses a sand/salt mixture provided by the county government

## **E. Mechanical Systems Operational Requirements**

Regularly scheduled preventative maintenance on HVAC systems will be documented to ensure healthy, indoor air quality, climate control and longevity of equipment. Building Maintenance Plans will be in place to document preventative maintenance routines, indoor air quality assessments, schedules of required tasks, i.e. filter changes, lubrication and calibration, service records on ventilation systems, proper operating values, and log sheets.

## ***F. Staff Training***

Training will be provided to all cleaning staff for all methods and products described within this plan. A Safety Manual is available on site and is accessible to all staff members. Safety Manual shall include contact information to direct product questions, emergency contact for hazardous event (such as a spill), MSDS for all products, and step-by-step instructions for proper use of each product (including use, dilution, and disposal). If cleaning staff is non-English speaking, consider using training and Safety Manual that is in multi-lingual format and/or provide dilution instructions in pictorial format. Training for proper use of specific products should be provided through the product manufacturer or distributor if offered. Training must include, at a minimum:

1. General orientation
2. Review of this plan, including intent, procedures, and products; incorporate into semi-annual staff training
3. On-site supervised training:
  - a. General cleaning practices and techniques
  - b. Use and care of housekeeping equipment and supplies
  - c. Housekeeping chemicals
4. Review of Safety Manual and where it is located for reference
5. Review of universal warning symbols pertaining to hazardous substances and waste
6. Instruction on how to read a material safety data sheet (MSDS)

Where applicable, procurement training will be provided for responsible parties. Procurement training will include, at a minimum, review of the requirements in this plan and all referenced standards. Checklists will be provided and posted on site for cleaning staff that describe procedural requirements in accordance with this plan.

## Section IV – Resources

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### A. Additional Information:

1. Agency for Toxic Substances and Disease Registry, <http://atsdr.cdc.gov>
2. Center For Disease Control and Prevention, [www.cdc.gov](http://www.cdc.gov)
3. Center for Health, Environment and Justice, [www.chej.org](http://www.chej.org)
4. Environmental Protection Agency (EPA), [www.epa.gov](http://www.epa.gov)
5. European Eco-Label Catalogue, [www.eco-label.com](http://www.eco-label.com)
6. Green Seal, *Choose Green Reports*, [www.greenseal.org](http://www.greenseal.org)
7. Healthy Schools Network, *Guide to Healthier Cleaning & Maintenance Practices and Products*, [www.healthyschools.org](http://www.healthyschools.org)
8. Inform, *cleaning for Health: Products and Practices for a Safer Indoor Environment*, [www.informinc.org](http://www.informinc.org)
9. Institute for Health and Environment, [www.albany.edu/ihe](http://www.albany.edu/ihe)
10. National Institute of Environmental Health Sciences (NIEHS), [www.niehs.nih.gov](http://www.niehs.nih.gov)
11. Natural Resources Defense Council (NRDC), [www.nrdc.org](http://www.nrdc.org)
12. New American Dream, *List of Approved Cleaning Products*, [www.newdream.org](http://www.newdream.org)
13. Ninth Report on Carcinogens, U.S. Department of Health and Human
14. US Green Building Council, [www.usgbc.org](http://www.usgbc.org)

### B. Product Manufacturers:

- Betco, *"Green" Products*, [www.betco.com](http://www.betco.com)
1. The Clean Environment Company, [www.cleanenvironmentco.com](http://www.cleanenvironmentco.com)  
Cleanline Products, [www.cleanlineproducts.com](http://www.cleanlineproducts.com)
  2. Cogent Environmental Solutions, [www.ecogent.ca](http://www.ecogent.ca)
  3. CPC Aeroscience, *SOYLution*, [www.cpcaserosols.com/soylution/](http://www.cpcaserosols.com/soylution/)
  4. EcoLab, [www.ecolab.com](http://www.ecolab.com)
  5. Eco-Products, [www.ecoproducts.com](http://www.ecoproducts.com)
  6. Enviro-Solutions, [www.enviro-solution.com](http://www.enviro-solution.com)
  7. EnvirOx, [www.h2orange2.com](http://www.h2orange2.com)
  8. Interstate Products, Inc., *Natural Cleaners*, [www.interstateproducts.com/natural.htm](http://www.interstateproducts.com/natural.htm)
  9. Healthy Green Buildings, *Environmental Guardian*, Commercial Cleaning Products, [www.cleaningpro.com/products/commercial/commercial.htm](http://www.cleaningpro.com/products/commercial/commercial.htm)
  10. The Real Earth, Inc., [www.treeco.com](http://www.treeco.com)
  11. Rochester Midland Corporation, [www.rochestermidland.com/division/institut/ghouse.html](http://www.rochestermidland.com/division/institut/ghouse.html)
  12. Seventh Generation, [www.seventhgeneration.com](http://www.seventhgeneration.com)
  13. Penford Products., [www.penfordproducts.com](http://www.penfordproducts.com)
  14. Glacial Technologies, [www.anti-icers.com](http://www.anti-icers.com)
  15. Seneca Mineral, [www.senecamineral.com](http://www.senecamineral.com)
- Dow, [www.dow.com](http://www.dow.com)

## Section V – Definitions

<b>A</b>	<b>Antimicrobial</b>	An agent that destroys or inhibits the growth of micro-organisms, such as bacteria and fungi
	<b>ASTM</b>	American Society for Testing and Materials
<b>B</b>	<b>Bathroom Cleaners</b>	A category of products used to clean hard surfaces in a bathroom, such as counters, walls, floors, fixtures, basins, tubs, and tile. It includes products that are required to be registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), such as disinfectants and sanitizers, but does not include products specifically intended to clean toilet bowls.
	<b>Bio-Accumulation</b>	The tendency of a substance to concentrate in the tissues of organisms over time.
	<b>Biodegradable</b>	material that can be broken down by microorganisms into simpler, more stable compounds
	<b>BOD</b>	Biological oxygen demand
	<b>Building-Related Illness</b>	Illness whose cause and symptoms can be diagnosed and attributed to a specific pollutant source within a building
<b>C</b>	<b>Carcinogen</b>	A chemical listed as a known, probable, or possible human carcinogen by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), the U.S. Environmental Protection Agency, or the Occupational Health and Safety Administration.
	<b>CPSC</b>	Consumer Product Safety Commission
	<b>Concentrate</b>	A product that must be diluted by at least eight parts by volume water prior to its intended use.
	<b>Contaminant</b>	A substance (physical, biological, chemical or radiological) that has an adverse effect on soil, air and/or water
	<b>Corrosive</b>	A substance that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact.
<b>D</b>	<b>Dispensing System</b>	Products designed to be used in dispensing systems that cannot be practically accessed by users.
	<b>Concentrate</b>	
	<b>Disinfectant</b>	Products used on hard surfaces to destroy or irreversibly inactivate all forms of microbial life, but not necessarily their spores. Not all disinfectants destroy all types of microbes.
	<b>DOC</b>	Dissolved organic carbon
<b>F</b>	<b>FIFRA</b>	Federal Insecticide, Fungicide, and Rodenticide Act
	<b>Fungus</b>	A group of organisms such as mildew, mold, yeast and mushrooms, that lack chlorophyll.
<b>G</b>	<b>Glass Cleaners</b>	A category of products used to clean windows, glass, and polished surfaces.
	<b>General Purpose Cleaners</b>	Products used for routine cleaning of hard surfaces including impervious flooring such as concrete or tile.
<b>H</b>	<b>HSDB</b>	Hazardous Substance Data Bank
<b>I</b>	<b>IAQ (Indoor Air Quality)</b>	Considered to be acceptable when no known air-borne contaminants exist at concentrations that may be harmful or cause irritation.
	<b>Ingredient</b>	Any constituent of a product, whether intentionally added or not, that comprises at least 0.01% by weight of the product.
	<b>ISO</b>	International Organization for Standardization
	<b>IARC (International Agency for Research on Cancer)</b>	An arm of the World Health Organization that studies association between substances and cancer.
<b>M</b>	<b>Microbial Growth</b>	Multiplication of microorganisms such as fungi and bacteria

	<b>Mutagen</b>	A substance that has been linked to increased rates of genetic mutation (above the average rate).
<b>N</b>	<b>Neurotoxin</b>	A substance with toxic effects on any portion of the central or peripheral nervous system.
	<b>NIOSH (National Institute for Occupational Safety and Health)</b>	Part of the U.S. Department of Health and Human Services that conducts research and makes recommendations on health and safety standards, including setting short- and long-term exposure limits for many chemicals.
<b>O</b>	<b>Off-Gassing</b>	The vaporization of chemical compounds into surrounding air.
	<b>Optical Brighteners</b>	Additives designed to enhance the appearance of colors and whiteness in materials by absorbing ultraviolet radiation and emitting blue radiation. Also known as fluorescent whitening agents.
	<b>OSHA</b>	Occupational Safety and Health Administration
	<b>Ozone Depleting Compound (ODC)</b>	Any compound with the potential to deplete stratospheric ozone.
	<b>Ozone Depleting Potential (ODP)</b>	A relative measure of the ability of a substance to break down the stratospheric ozone layer.
<b>P</b>	<b>Post-Consumer</b>	Waste material that has served an intended use.
	<b>Post-Industrial</b>	Waste material from manufacturing processes.
	<b>ppm</b>	Parts per million
	<b>Primary Packaging</b>	The material physically containing and coming into contact with the product, no including the cap or lid of a bottle.
	<b>Product as Used</b>	The most concentrated form of the product that the manufacturer recommends for an intended use.
<b>R</b>	<b>Recyclable Packaging</b>	Any packaging that can be diverted from the waste stream through available processes and programs, and can be collected, processed, and returned to use in the form of raw materials or products.
	<b>Reproductive Toxin</b>	A chemical which may cause birth defects or sterility.
	<b>RTECS</b>	Registry of Toxic Effects of Chemical Substances
<b>S</b>	<b>Sanitizer</b>	Products that reduce, but do not necessarily eliminate, micro-organisms to level that are considered safe
	<b>Sick Building Syndrome</b>	a phenomenon in which building occupants experience a variety of health and/or comfort effects linked to time spent in a particular building, but where no specific illness or causative agent can be identified. Symptoms in sufferers often include headaches, eye irritation, and respiratory irritation.
	<b>Sterilizer</b>	Products used to destroy or eliminate all forms of microbial life, including spores. Primarily used in healthcare settings.
<b>T</b>	<b>Terratogen</b>	A substance that has been directly linked to birth defects during human fetus development.
	<b>Toxicity</b>	The degree to which a material causes or threatens to cause adverse health effects to living organisms at a given concentration. Expressed in exposure limits.
	<b>TVOC</b>	Total Volatile Organic Compounds; see VOC (Volatile Organic Compound)
<b>U</b>	<b>Undiluted Product</b>	The most concentrated form of a product produced by a manufacturer for transport outside its facility
<b>V</b>	<b>VOC (Volatile Organic Compound)</b>	Chemical compounds that contain carbon and that partially vaporize at normal room temperature. VOCs are a group of chemicals that have varying degrees of toxicity and effects.

## Section VI – Cleaning Checklist

	Y e s	N o
<b>GENERAL</b>		
1. Clean all door and window glass with window cleaner and microfiber cloth		
2. Clean all doors with general cleaning solution; clean from top to bottom		
3. Spot clean any graffiti on walls, floors, and desks; remove tape and chewing gum with the straight edge of a putty knife		
4. Post wet floor signs in cleaning area; remove only when floors are completely dry		
<b>GROUNDS CARE</b>		
1. Perform the following each day before students arrive: remove all graffiti (photograph and report to principal any gang-related graffiti); check that playground equipment does not have missing or loose parts; spread ground cover of outside play areas evenly; pick up trash and debris, including glass and sharp objects, from entire grounds and parking lots; empty all outside trashcans; remove any water puddles		
2. Mow lawns weekly, trimming around buildings, walks, and fence lines		
3. Rake grounds and remove leaves as required, being sure to keep doorways and entrances clear of leaves		
4. Clean storm drain grating weekly, or when backup occurs		
5. Inspect gutters and downspouts weekly or when observed to be stopped-up		
6. Clean roof drains monthly or when observed to be stopped-up		
7. Keep sidewalks and entrances free of ice and snow		
8. See also "ENTRYWAYS" below		
<b>ENTRYWAYS – DAILY</b>		
1. Clean exterior sidewalk and vestibule with high quality push broom or water hose		
2. Vacuum entryway mat in both directions (2 passes, minimum)		
3. Clean walls, doors, handles, push plates, and kick-plates inside and outside		
4. Empty all waste receptacles & recycling; clean outside of trash can and change liner if dirty		
<b>ENTRYWAYS – WEEKLY</b>		
1. Roll up and remove entryway mats inside and outside		
2. Sweep and then damp mop underneath interior entryway mat area; allow to dry completely prior to replacing entryway mat		
3. Sweep or pressure wash underneath exterior entryway mat; allow to dry completely prior to replacing entryway mat		
<b>DUSTING – DAILY</b>		
1. Use micro-fiber or damp lint-free cloth		
2. Dust from top to bottom		
3. Dust walls, desk tops, sills, ledges, shelves, bookshelves, blinds, furniture, and exit signs; damp wipe walls, woodwork, baseboards, trim, and window sills weekly		
4. Vacuum and damp wipe chalk trays, moving chalk and erasers to cleaned area		
<b>DUST MOPPING/VACUUMING – DAILY</b>		
1. Start from far corner and work towards the door		
2. Use continuous motion without lifting the mop/vacuum from the floor		
3. Turn and pivot mop head/vacuum and overlap previous path by 2 to 4 inches		
4. Pick up all debris with brush and dust pan; remove chewing gum with a putty knife		
5. Replace vacuum bags when $\frac{3}{4}$ full		
6. Spot clean carpet and floor areas		
7. Vacuum chalk board trays, vents, grates, crevices, and ceiling diffusers		
<b>MOPPING/VACUUMING – WEEKLY</b>		
1. Vacuum all fabric covered furnishings weekly		
2. spray buff hard floors to restore finish and dust mop after buffing		

<b>CARPET CARE – CLEANING</b>		
1. Apply spot treatment, as required		
2. Check for wet areas on carpet; blot and dry with wet-vac		
3. For chronic wet areas on carpet, remove water source, inspect carpet for mold, replace any carpet with signs of mold or mildew (visual or smell), if water source cannot be eliminated, remove carpet and replace with non-absorbent flooring surface		
4. See above for additional requirements		
<b>CARPET CARE – PRE-SPRAY/EXTRACTION</b>		
1. Apply spot treatment, as required		
2. Apply pre-spray to carpet and allow to sit 10-15 minutes		
3. Extract & rinse carpet with warm water on first pass		
4. Dry-extract on second pass		
5. Empty recovery tank when full (and refill rinse tank with warm water as required)		
<b>FLOOR CARE – BUFFING</b>		
1. Damp mop floor		
2. Apply spray buff in a stream or coarse spray (do not over-wet)		
3. Make 3 passes with a 175 rpm buffing machine (fitted with buffing pad) in a swinging motion across work area		
4. Change pads as necessary		
5. Mop floor with micro-fiber mop after entire area has been buffed		
<b>FLOOR CARE – BURNISHING</b>		
1. Damp mop floor		
2. Make one pass over the work area with burnisher		
3. Repeat second pass if desired gloss is not achieved		
4. Change pads as necessary		
5. Mop floor with micro-fiber mop after entire area has been buffed		
<b>FLOOR CARE – STRIPPING (to be performed upon request only)</b>		
1. Remove all gum and stuck-on debris with putty knife		
2. Damp mop floor		
3. Use edging tool along baseboards and corners		
4. Do not allow stripper to travel under doors or onto carpet areas		
5. Allow solution to sit per product manufacturer instructions, then scrub floor with rotary scrubber, changing direction by 90 degrees to improve agitation and removal		
6. Check floor for finish removal (no sticky areas)		
7. Remove slurry with clean mop; control slurry with squeegee		
8. Rinse floor thoroughly with clean cold water		
9. Re-check for residue by rubbing hand over dry surface		
<b>FLOOR CARE – FINISH &amp; SEALER APPLICATION</b>		
1. Pour enough finisher or sealer into lined bucket to cover work area (do not over-fill)		
2. Dip mop into finisher or sealer, and press out excess liquid		
3. Apply finish or sealer by framing out a 10' x 10' area, and then filling using an overlapping figure-8 motion		
4. Second coat may be applied, if desired, once first application is completely dry		
5. Discard bucket liner and left-over finisher/sealer per manufacturer disposal instructions		
6. Thoroughly clean mop head, bucket, and wringer		



<b>RESTROOMS</b>		
1. Damp mop floor (to remove debris)		
2. Apply product to interior of toilets and urinals		
3. Apply product to exterior of toilets and urinals using stream or course spray setting		
4. Apply products to sinks and countertops		
5. Fill dispensers and empty trash		
6. Clean mirrors		
7. Clean and wipe dispensers		
8. Wipe sinks and countertops with micro-fiber cloths		
9. Clean interior of toilets and urinals		
10. Clean exterior of toilets and urinals		
11. Clean switches, handles, door knobs, push plates		
12. Spot clean walls and toilet partitions		
13. Remove soap from shower floors, and clean all surfaces, including walls and fixtures; scrub shower floors with scrub brush and cleaning solution		
14. Mop the floor, removing all standing water		
15. Pour hot water germicidal solution into drain if clogged or odorous		
16. Apply disinfectant after cleaning all areas and rinse as directed		
<b>RECYCLING MATERIALS – COLLECTION AND REMOVAL</b>		
1. Empty all designated containers used in collection of recycled paper and commingled materials; keep materials separated		
2. Transport to outdoor collection containers and deposit into appropriate container		
3. Return all emptied containers to original location		
4. Damp wipe inside and outside of soiled or odorous recycling containers		
5. Break-down and deposit corrugated cardboard designated for recycling and deposit in appropriately labeled outdoor container		

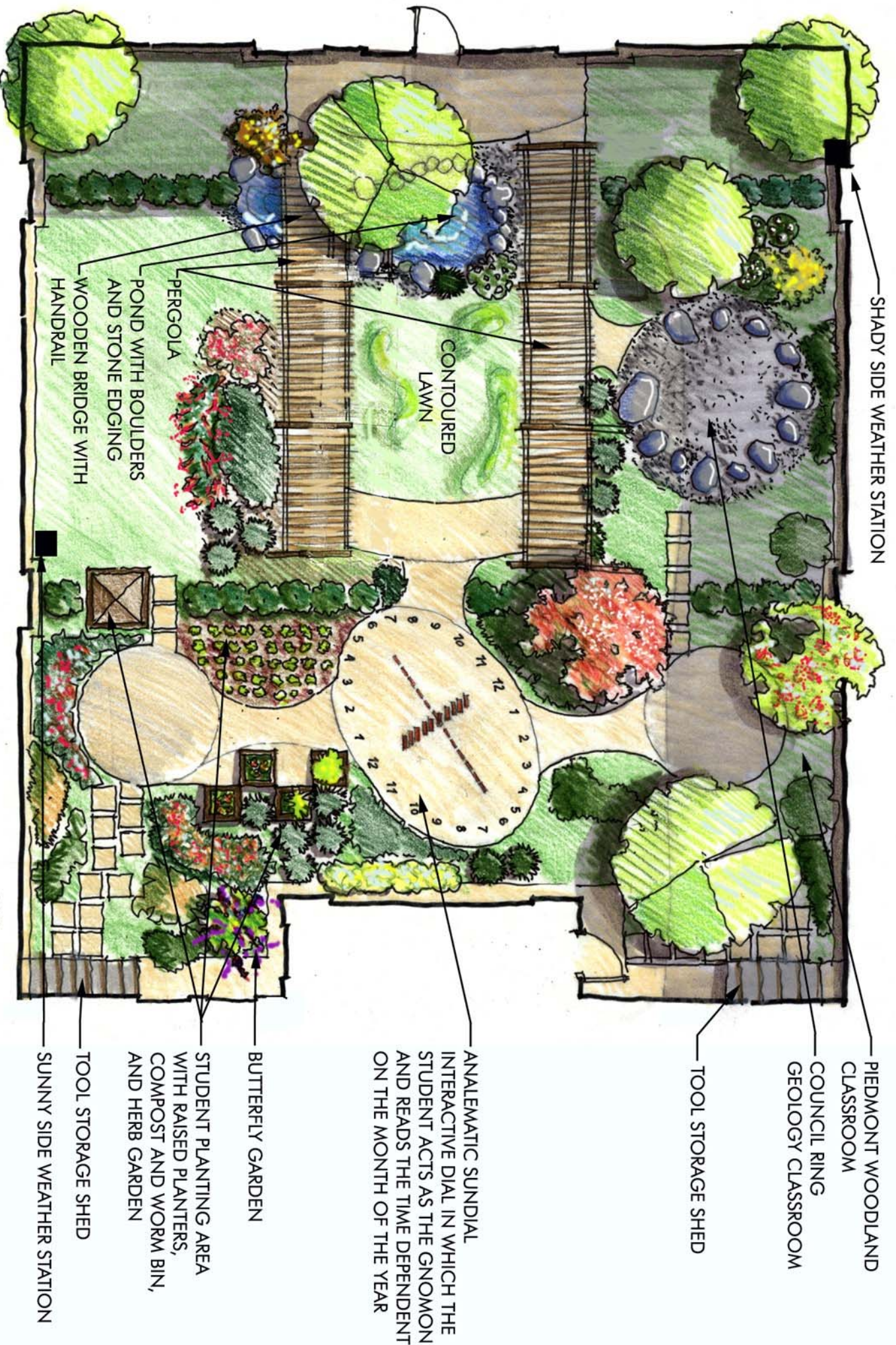
## SECTION VII - ATTACHMENTS

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# **Great Seneca Creek Elementary School – Green Binder**

## **7. Future Green Projects**

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SHADY SIDE WEATHER STATION

PIEDMONT WOODLAND CLASSROOM

COUNCIL RING GEOLOGY CLASSROOM

TOOL STORAGE SHED

CONTOURED LAWN

ANALEMMATIC SUNDIAL  
INTERACTIVE DIAL IN WHICH THE STUDENT ACTS AS THE GNOMON AND READS THE TIME DEPENDENT ON THE MONTH OF THE YEAR

BUTTERFLY GARDEN

STUDENT PLANTING AREA WITH RAISED PLANTERS, COMPOST AND WORM BIN, AND HERB GARDEN

PERGOLA  
POND WITH BOULDERS AND STONE EDGING  
WOODEN BRIDGE WITH HANDRAIL

TOOL STORAGE SHED  
SUNNY SIDE WEATHER STATION

# GREAT SENECA CREEK ELEMENTARY SCHOOL EDUCATIONAL COURTYARD DESIGN

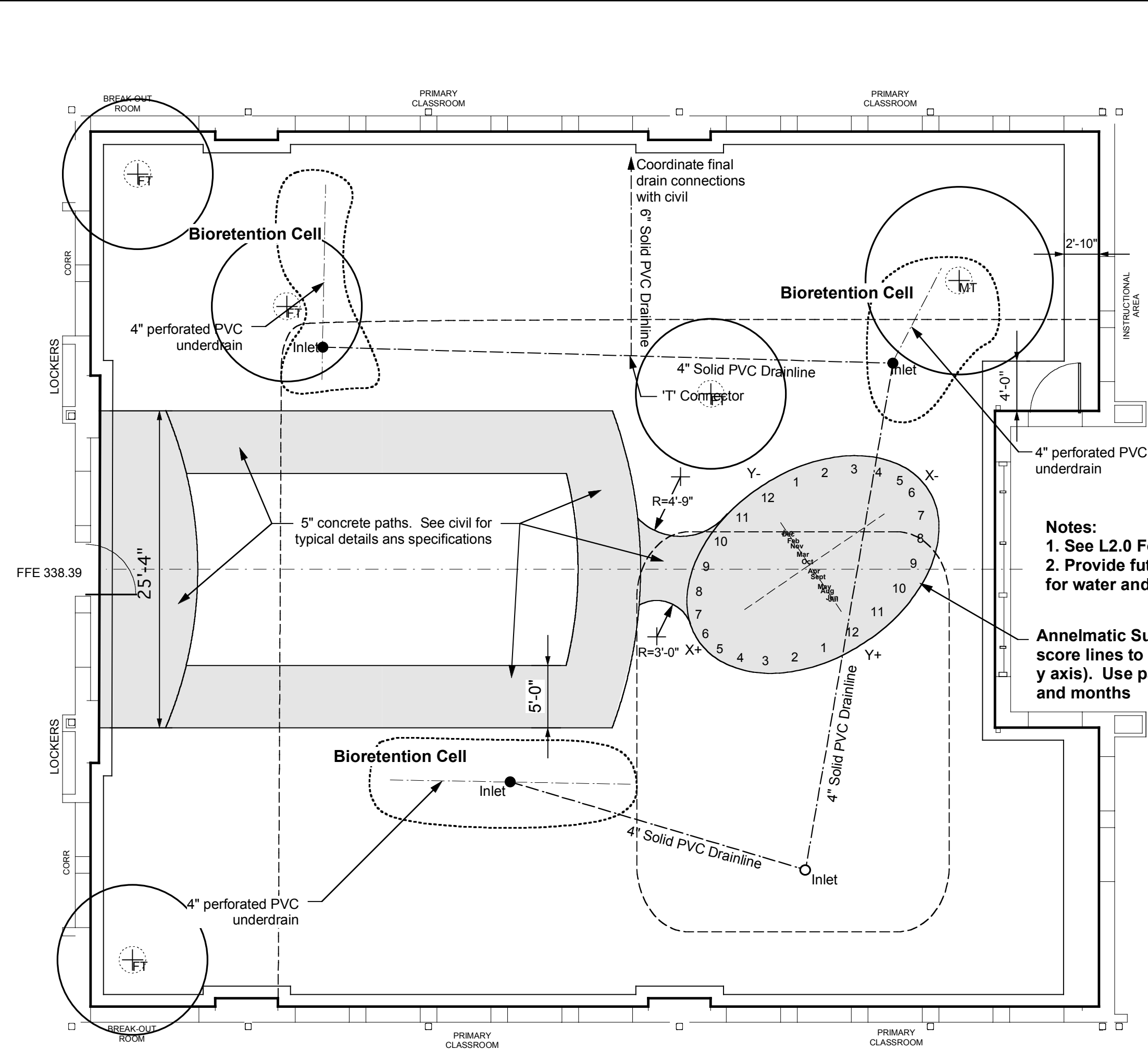
MONTGOMERY COUNTY PUBLIC SCHOOLS / GRIMM + PARKER ARCHITECTS / SOUTH FORK STUDIO



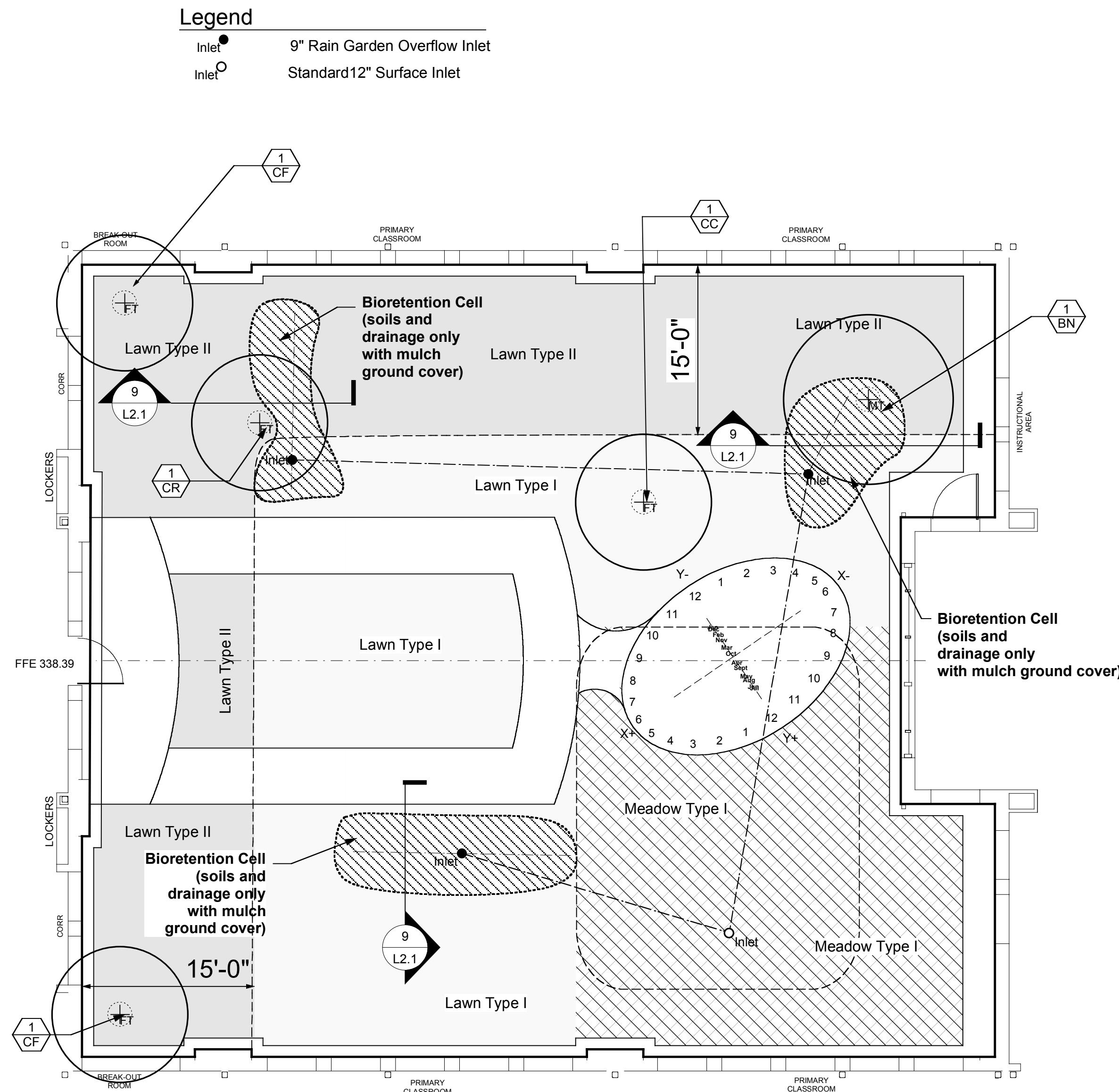


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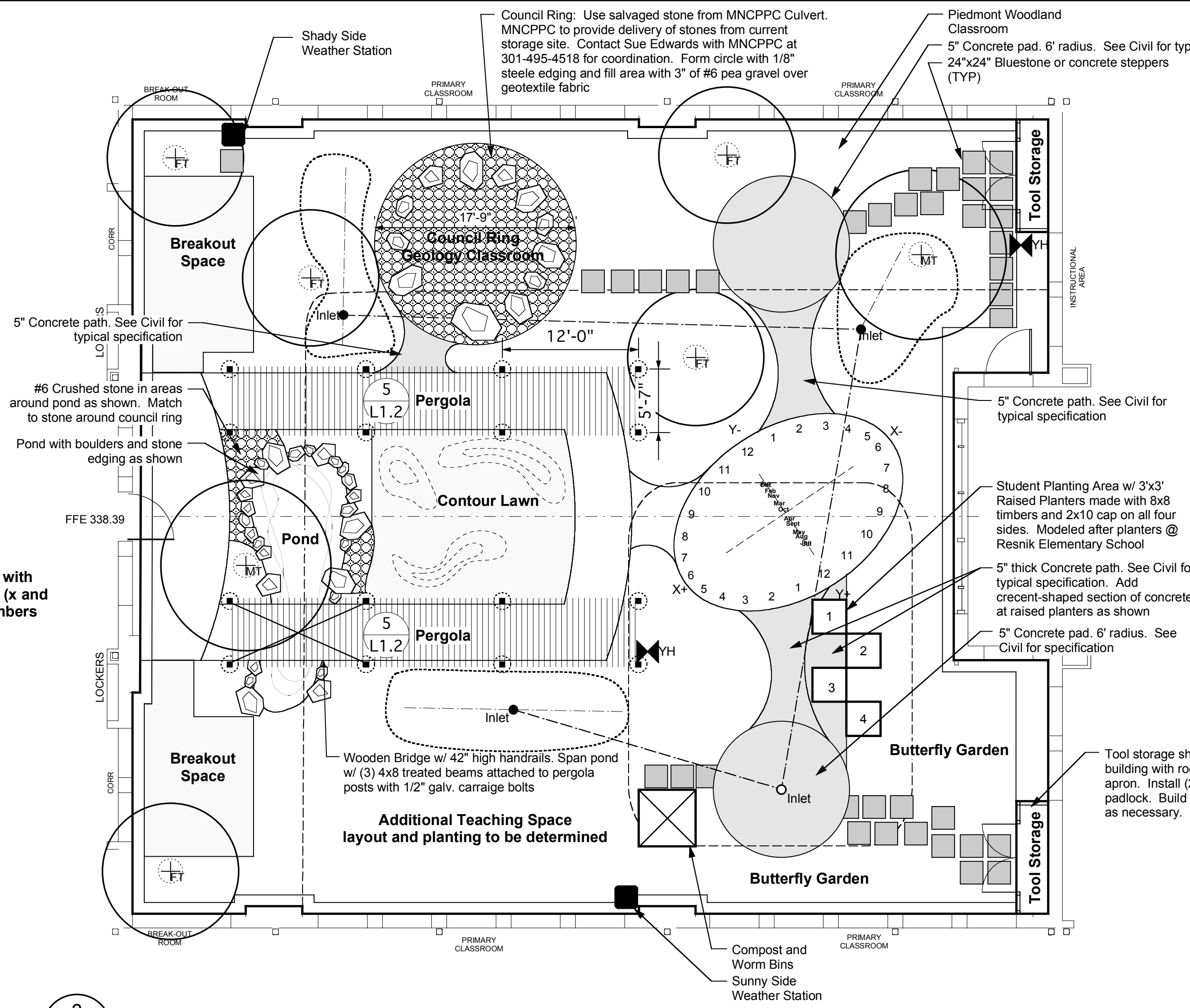
1  
L1.2  
Enlarged Courtyard Layout Plan - Base Bid  
Scale: 1/8" = 1'-0"



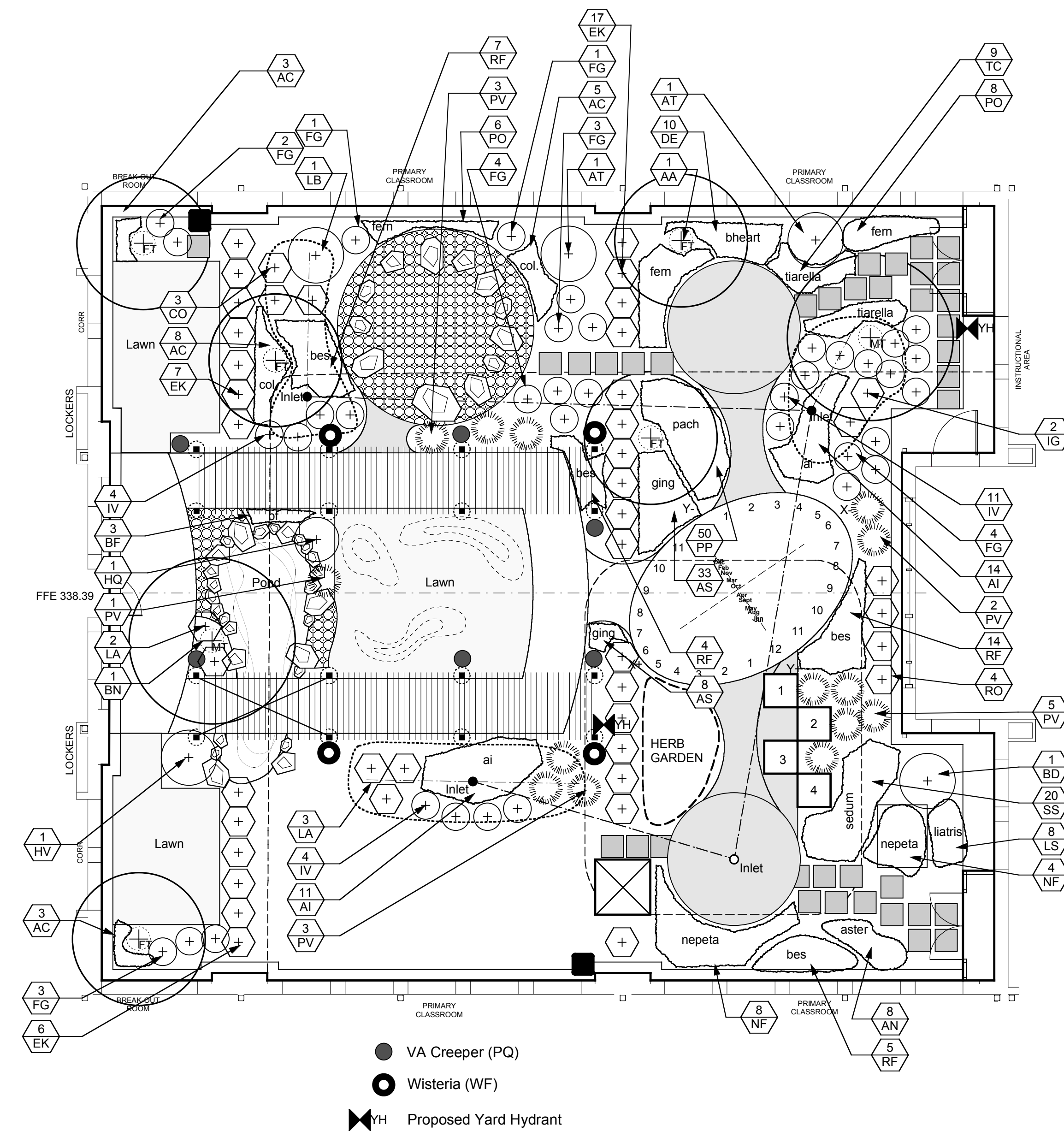
**COURTYARD BASE BID PLANT SCHEDULE**

Key	Qty	Botanical / Common Names	Size	Root	Notes
<b>Trees</b>					
BN	1	Betula nigra / River Birch	8'-10' ht.	B&B	Clump Form
CC	1	Cercis canadensis / Redbud	1 3/4"-2"	B&B	Multi-Stem
CF	2	Cornus Florida / Dogwood	5'-6' ht.	B&B	

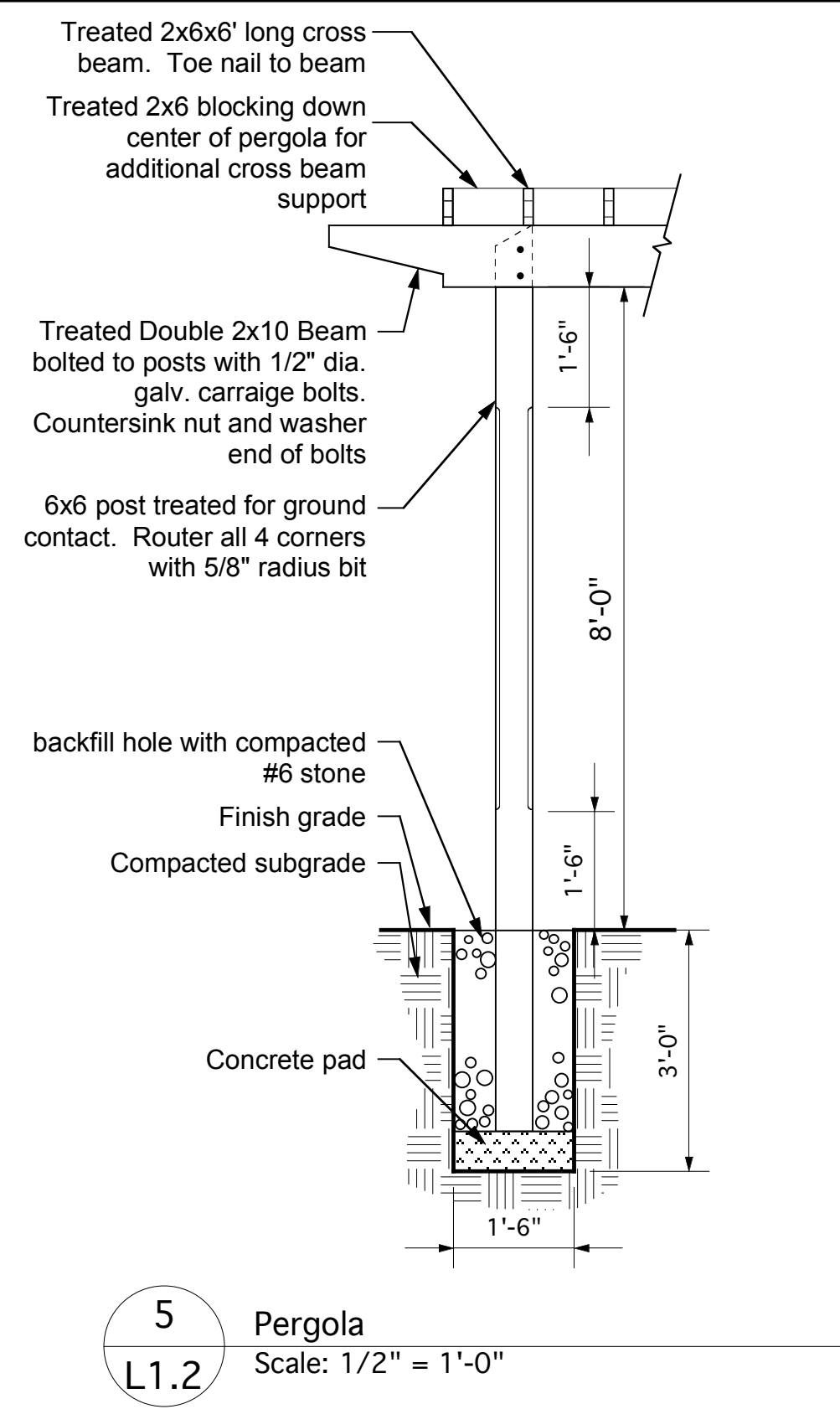
2  
L1.2  
Enlarged Courtyard Layout Plan - Base Bid Planting Plan  
Scale: 1/8" = 1'-0"



3  
L1.2  
Enlarged Courtyard Layout Plan - Alternate #10  
Scale: 1/8" = 1'-0"

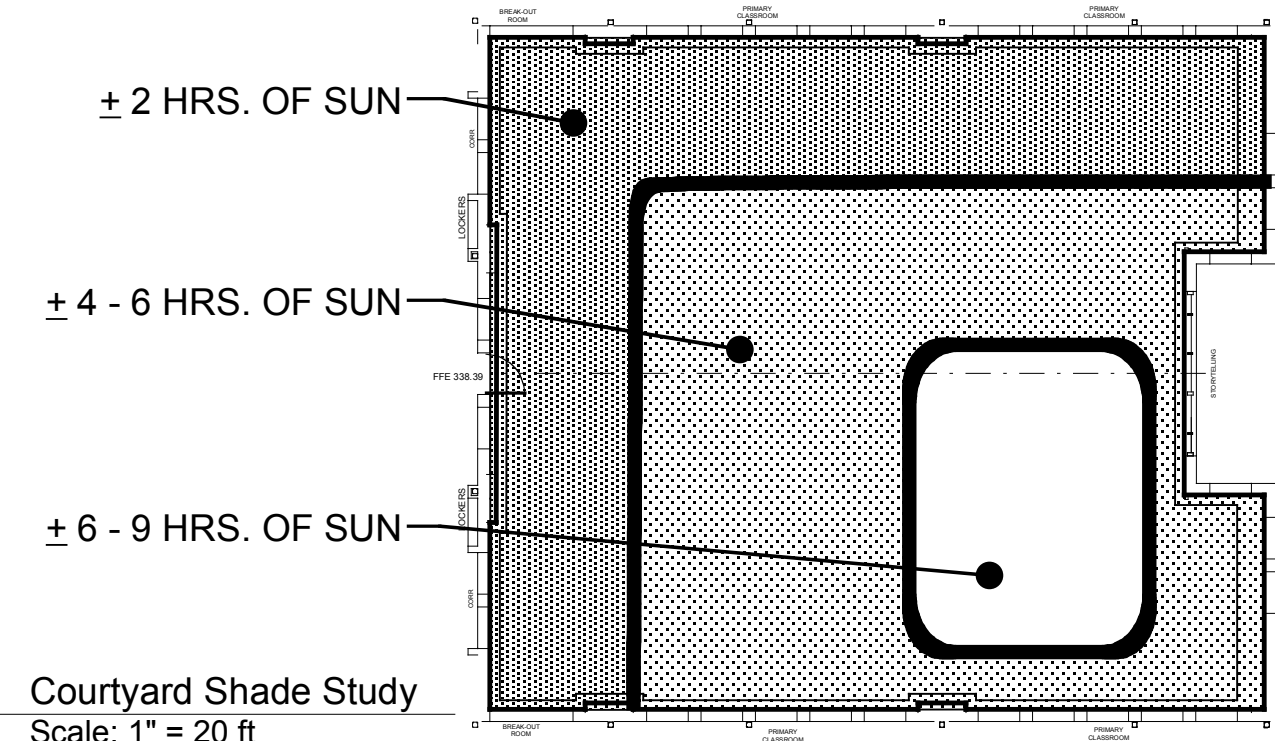


4  
L1.2  
Enlarged Courtyard Layout Plan - Alternate #10 Planting Plan  
Scale: 1/8" = 1'-0"

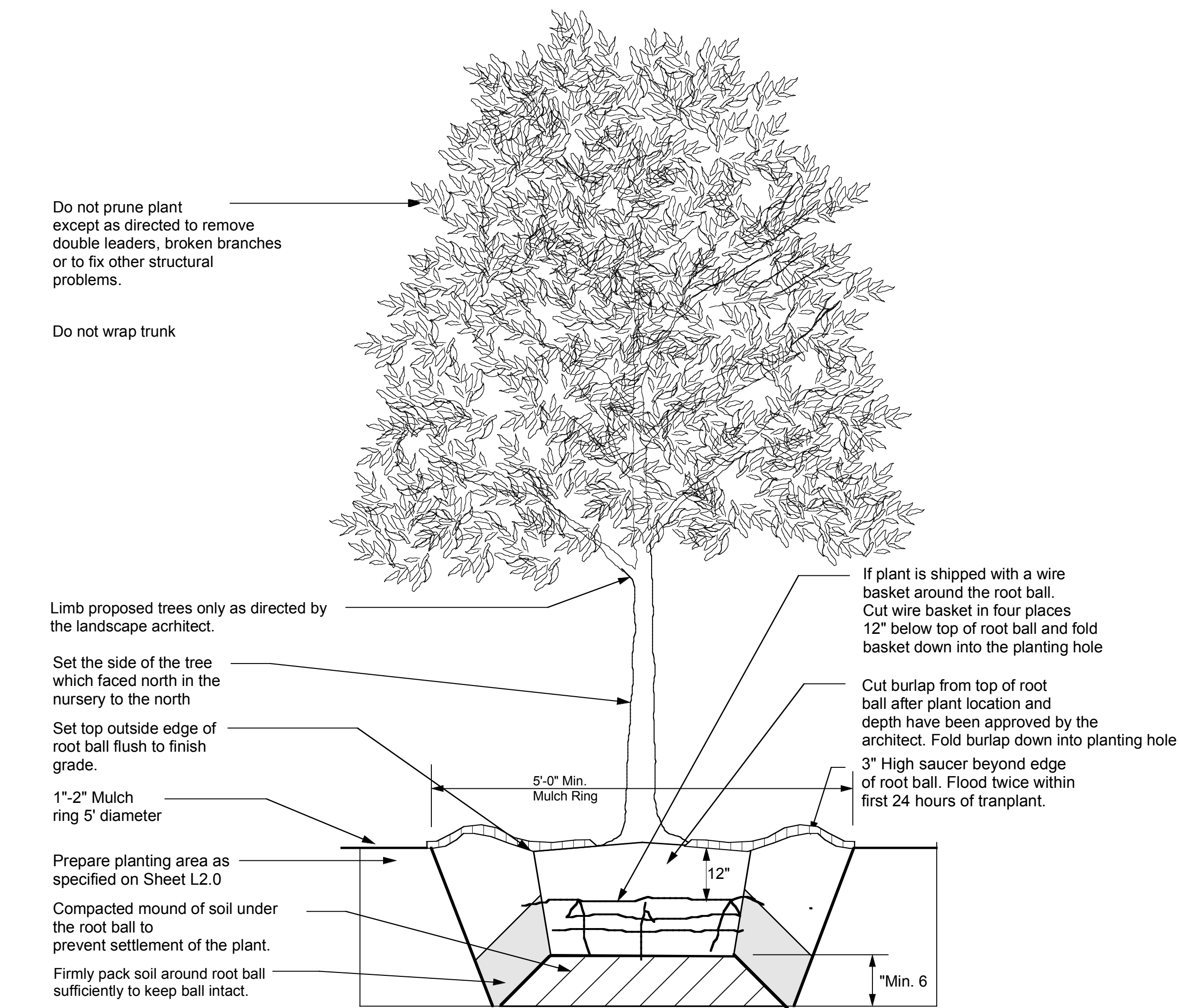


**COURTYARD ALTERNATE #10 PLANT SCHEDULE**

Key	Qty	Botanical / Common Names	Size	Root	Notes
<b>Trees</b>					
AA	1	Amelanchier x grandiflora 'Forest Prince' / Downy Serviceberry	1 3/4"-2"	B&B	Single Stem
BN	1	Betula nigra / River Birch	8'-10' ht.	B&B	Clump Form
CR	1	Cornus x Rutger / Stellar Pink Dogwood	5'-6' ht.	B&B	
<b>Shrubs</b>					
AT	2	Asimina triloba / Common Pawpaw	5'-6' ht.	B&B	
BD	1	Buddleia spp. / Butterfly Bush	24"-36"	cont.	
CO	3	Cephalanthus occidentalis / Buttonbush	24"-36"	cont.	
EK	30	Euonymus kiautschovicus 'Manhattan' / Spreading Euonymus	24"-36"	cont.	
FG	16	Fothergilla gardenii / Dwarf Fothergilla	7 gal.	cont.	
HV	1	Hamamelis virginiana / Common Witch-hazel	24"-36"	cont.	
HQ	1	Hydrangea quercifolia 'Snowflake' / Oakleaf Hydrangea	24"-36"	cont.	
IG	2	Ilex glabra 'Shamrock' / Shamrock Inkberry Holly	18"-24"	cont.	
IV	19	Itea virginica 'Little Henry' / Virginia Sweetspire	18"-24" ht.	cont.	
LA	5	Leucothoe axillaris / Coast Leucothoe	5 gal.	cont.	
LB	1	Lindera Benzoin / Spice Bush	24"-36"	cont.	
RO	4	Rhus aromatica 'Grow Low' / Fragrant Sumac	3 gal.	cont.	
<b>Perennials &amp; Grasses</b>					
AC	19	Aquilegia canadensis / Columbine	1 gal.	cont.	18" o.c.
AI	25	Asclepias incarnata / Swamp Milkweed	1 gal.	cont.	24" o.c.
AN	8	Aster novae-angliae 'Purple Dome' / New England Aster	1 gal.	cont.	18" o.c.
DE	10	Dicentra eximia / Wild Bleeding Heart	1 gal.	cont.	18" o.c.
LS	8	Liatris spicata / Gay Feather	1 gal.	cont.	24" o.c.
BF	3	Iris versicolor / Blue Flag Iris	1 gal.	cont.	18" o.c.
NF	12	Nepeta faassenii 'Droptail' / Catmint	1 gal.	cont.	30" o.c.
PV	14	Panicum virgatum 'Hanse Herms' / Switch Grass	3 gal.	cont.	36" o.c.
PO	14	Polystichum acrostichoides / Christmas Fern	1 gal.	cont.	18" o.c.
RF	30	Rudbeckia fulgida 'Fulgida' / Black Eyed Susan	1 gal.	cont.	24" o.c.
SS	20	Sedum spectabilis 'Autumn Joy' / Stonecrop	1 gal.	cont.	18" o.c.
TC	9	Tiarella cordifolia / Foamflower	1 gal.	cont.	18" o.c.
<b>Vines and Groundcover</b>					
AS	41	Asarum canadense / Wild Ginger	1 Qt.	cont.	8" o.c.
PP	50	Pachysandra procumbens / Allegheny Spurge	1 Qt.	cont.	
PQ	6	Parthenocissus quinquefolia / Virginia Creeper	1 gal.	cont.	
WF	4	Wisteria frutescens 'Amethyst Falls' / American Wisteria	2 gal.	cont.	



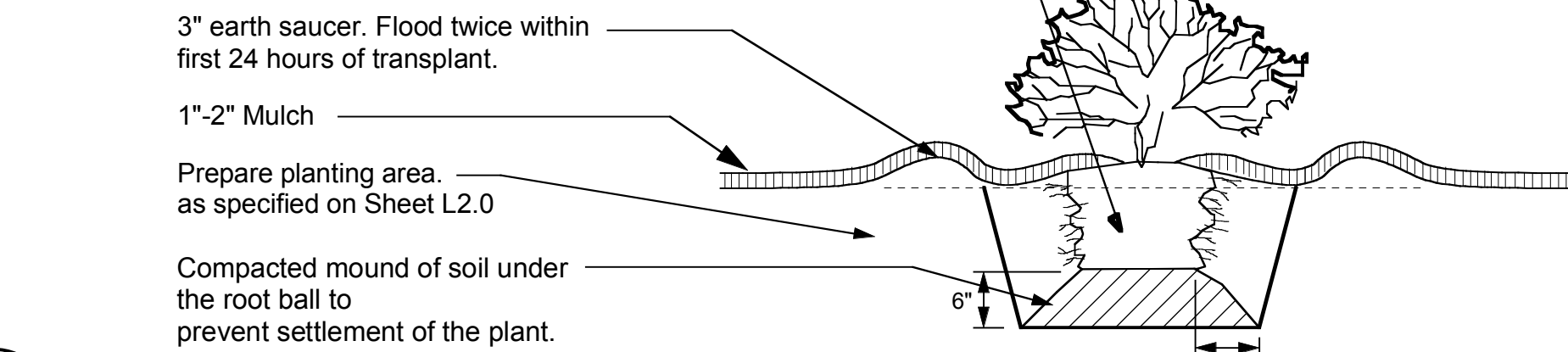




3 TYPICAL TREE PLANTING DETAIL

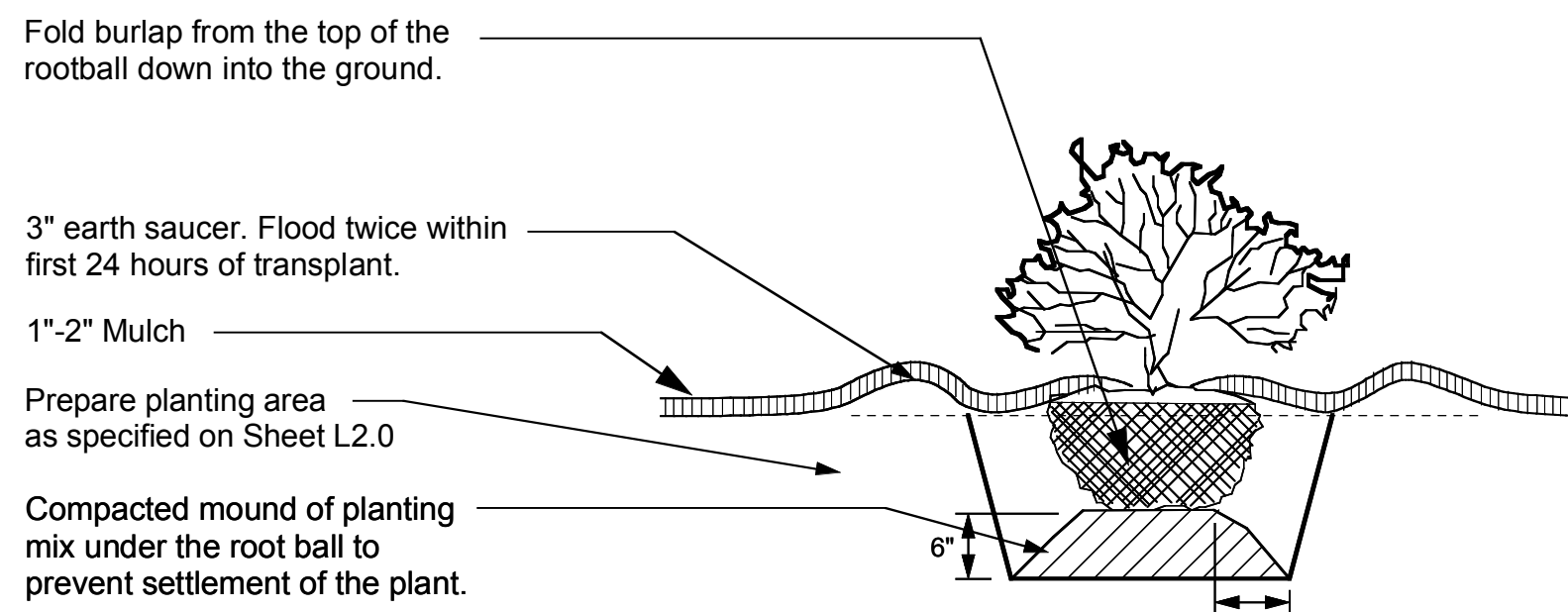
Scale: 3/4" = 1'-0"

**PULL OR WASH POTTING MIX AND ROOT MAT APART TO DIRECT THE OUTER ROOTS INTO THE ADJACENT SOIL. DO NOT LEAVE CIRCLING ROOTS AGAINST THE ROOT BALL. PLANTS WITH ROOT BALLS THAT HAVE NOT BEEN ROUGHENED WILL BE REJECTED**



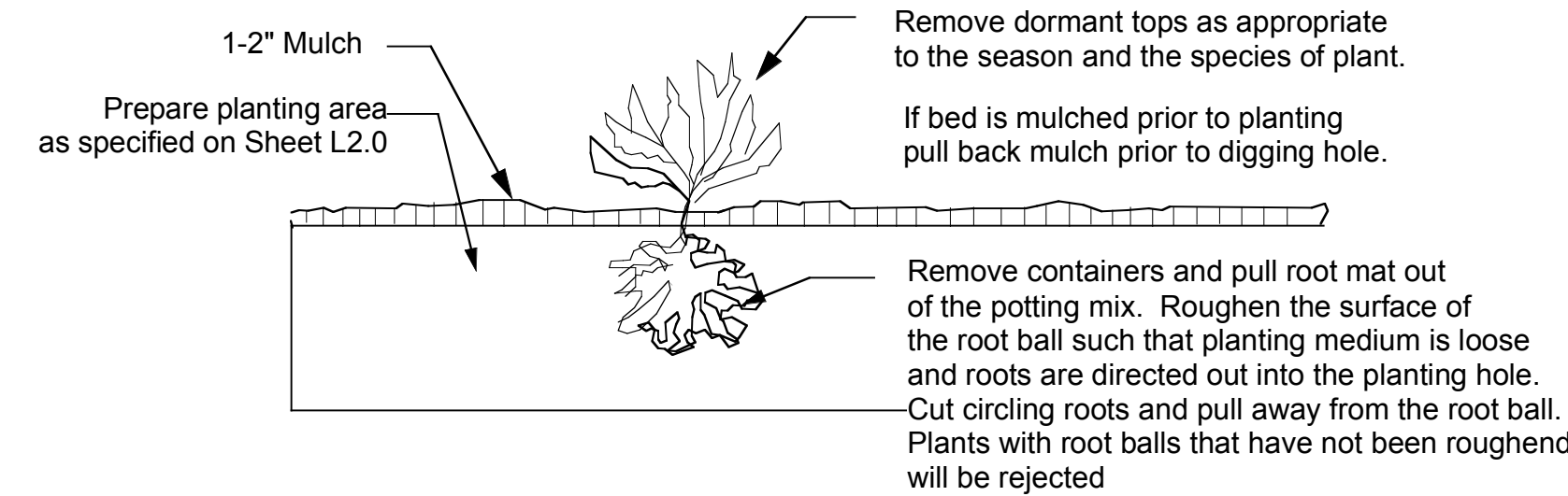
4 TYPICAL SHRUB PLANTING DETAIL - Container

Scale: 3/4" = 1'-0"



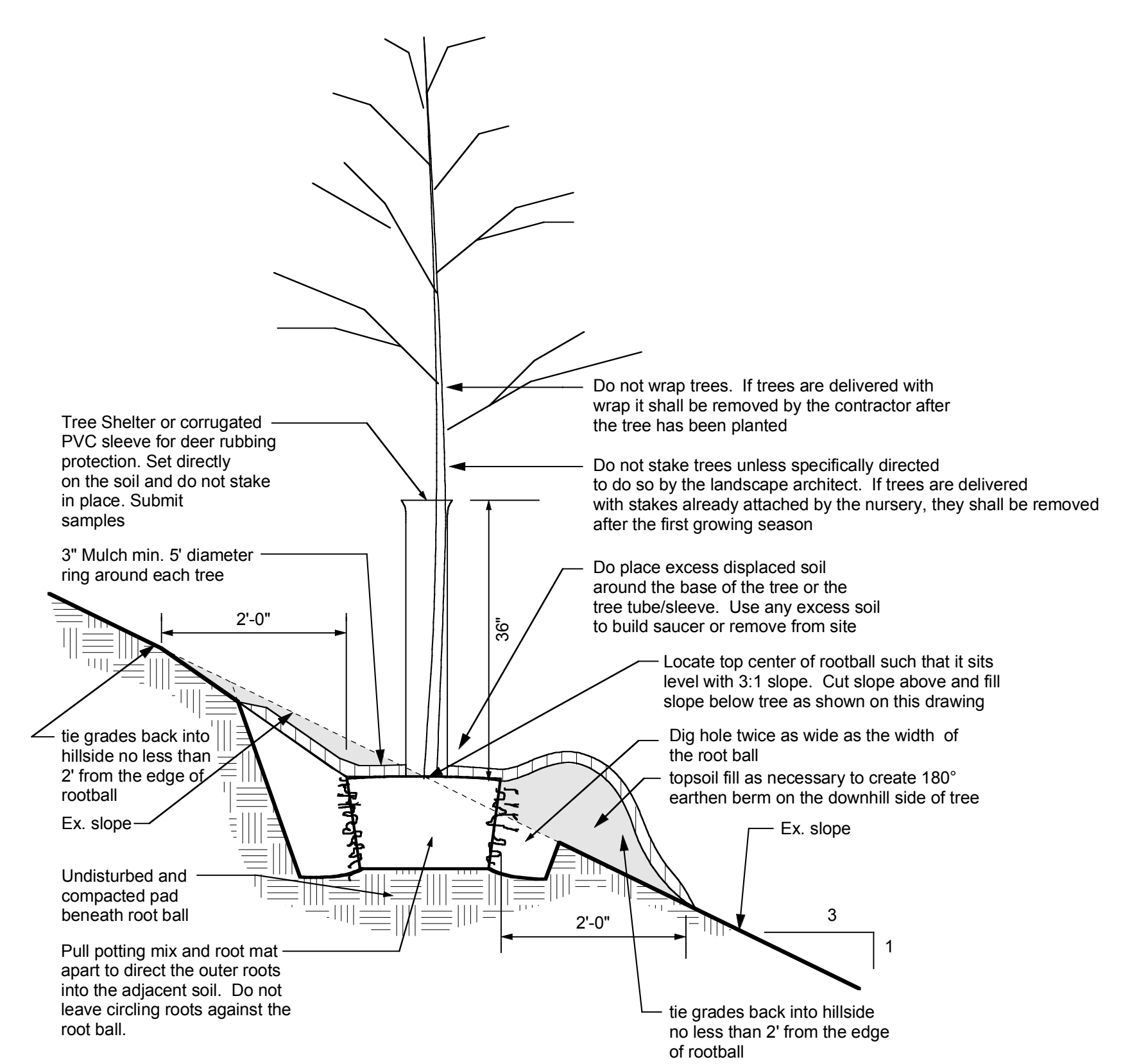
5 TYPICAL SHRUB PLANTING DETAIL - B&B

Scale: 3/4" = 1'-0"



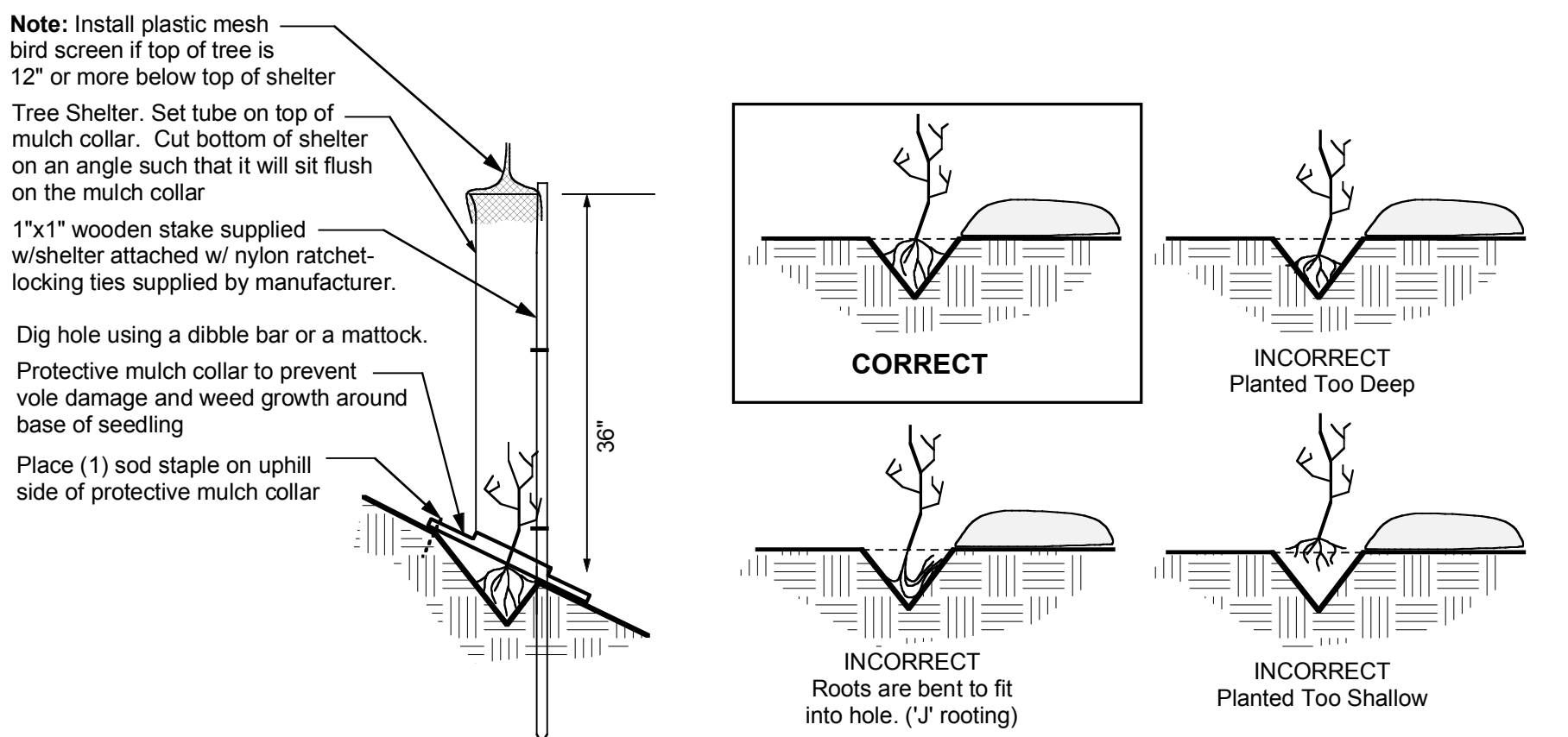
6 PERENNIAL AND GROUND COVER PLANTING DETAIL

Scale: 3/4" = 1'-0"



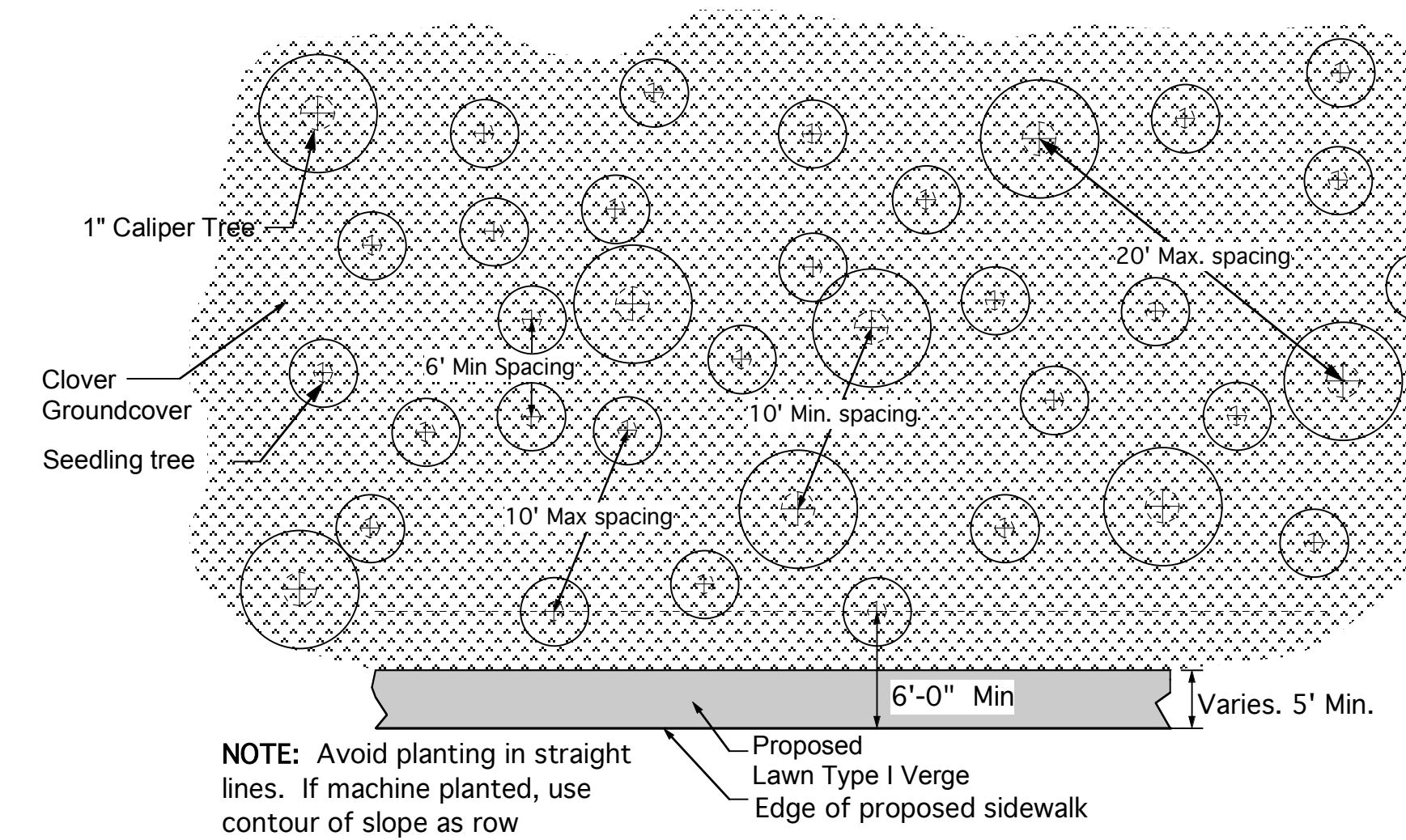
7 1" Caliper Tree Planting Detail-Container

Scale: 3/4" = 1'-0"



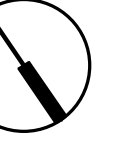
8 3:1 Slope Seedling Planting Detail-Bare Root

Scale: 3/4" = 1'-0"



9 Detailed Plan - Afforestation Tree Spacing

Scale: 1/8" = 1'-0"





## **Great Seneca Creek ES**

### **Green Wish List –**

**Please contact Green Building Program Manager at 240-314-1090**

**1. Green Touchscreen**

[www.GreenTouchScreen.com](http://www.GreenTouchScreen.com)

Customized Interactive Software Program to explain green design – connected to computer lab and MCPS website – components can be used for other schools  
\$30,000

**2. Green Information Kiosk**

Binder Stand in Lobby – Binder Stand with ring binder that explains green building features and LEED - \$300 sponsored by NORESKO

**3. Outdoor Signage**

for

Geothermal - No-Mow Zones - Native Vegetation - Wetlands

Sturdy, weather proof sign with concrete base - App. \$500 each (6 total)

**4. Educational Courtyard**

Outdoor classroom with pond, raingardens, pergola, planting beds for students  
\$5,000-\$45,000

**5. Classroom Signage**

More green signage for classroom

8 ½ x 11 signs throughout the building with color copies to explain green building technology in classrooms - \$500

**6. Curriculum Development**

Curriculum Material for all teachers for tour and games - Develop bullfrog mascot for green graphic material - \$1,000

**7. Volunteers**

Planting, Tour Guides, Chair of Environmental Club - Sweat Equity

**8. Interior Light Shelves (mock-up in classrooms with most light)**

**9. Dual Flush Valves – Sloan Uppercut (retrofit all student toilets)**

**10. Green Roof Pilot – Mock-up Shed**

**11. Electrical Lawn Mower (for Little Bennett ES)**

**12. Occupancy Sensors for areas above 300W**